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TO
THE ADVANCEMENT OF
EDUCATION IN AMERICA
THIS BOOK IS DEDICATED

THE PRIVATE OFFICE BUILDING OF PERKINS, FELLOWS AND HAMILTON, 814 TOWER COURT, CHICAGO, ILLINOIS

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FOREWORD

AT THE CLOSE OF A PERIOD OF TWENTY YEARS OF ACTIVITY, DURING WHICH THEY HAVE ENJOYED EXCEPTIONAL OPPORTUNITIES FOR SERVICE, THE AUTHORS OF THIS BOOK AND OF THE WORKS DESCRIBED THEREIN THINK IT APPROPRIATE AND OPPORTUNE THAT THEY RENDER AN ACCOUNT OF THEIR LABORS TO THE PUBLIC, WHOSE FUNDS THEY HAVE EXPENDED, AND TO THE EDUCATORS WHOSE ACTIVITIES THEY HAVE BEEN CALLED UPON TO INTERPRET AND HOUSE IN BRICK AND STONE ▽ ▽

THE STUDY OF EDUCATION IS A STUDY OF AMERICANIZATION AND ITS DEVELOPMENT IN CIVIC AND SOCIAL LIFE ▽ ▽ ▽ ▽

IN NO WAY ARE THESE CHANGES MORE EVIDENT THAN IN THE CHANGED REQUIREMENTS OF EDUCATIONAL HOUSING ▽ ▽ ▽ ▽

THE PROBLEM AT FIRST SIMPLE BECOMES INCREASINGLY COMPLEX WITH THE ADDED FIELDS OF EDUCATIONAL ENDEAVOR AND THE INCREASING DEMANDS FOR SOCIAL AND CULTURAL DEVELOPMENT ▽ ▽

PARTICULARLY IS THIS TRUE IN THE SMALLER CITIES AND TOWNS, FOR THERE THE SCHOOL HAS BECOME THE CENTER OF COMMUNITY LIFE ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽

THE AUTHORS ACKNOWLEDGE THEIR GRATITUDE TO THE EDUCATORS AND PUBLIC OFFICIALS WHOSE CONTINUED PATRONAGE HAS BEEN THE MEANS BY WHICH THE PROFESSIONAL SERVICE INSTITUTION KNOWN AS PERKINS FELLOWS AND HAMILTON, ARCHITECTS, HAS BEEN CREATED, ITS PERSONNEL ORGANIZED, TRAINED AND MAINTAINED FOR SERVICE IN THIS ESPECIAL FIELD ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽

AS IMPORTANT COLLABORATORS TOWARD THE RESULT OF THEIR LABORS, HEREIN ILLUSTRATED, THE AUTHORS ESPECIALLY ACKNOWLEDGE THE PARTICIPATION OF WILFRED F. BEARDSLEY, PRINCIPAL OF EVANSTON TOWNSHIP HIGH SCHOOL, HENRY E. BROWN AND ESTON V. TUBBS, PRINCIPALS OF NEW TRIER TOWNSHIP HIGH SCHOOL, M. R. McDANIEL, PRINCIPAL OF OAK PARK AND RIVER FOREST TOWNSHIP HIGH SCHOOL AND N. B. SLOAN, PRINCIPAL OF BAY CITY HIGH SCHOOL, AND TO SUPERIN TENDENTS J. H. BENTLEY AND W. G. BATE OF RICHMOND, INDIANA, E. W. WAITE OF MANITOWOC, WISCONSIN, G. L. JENNER OF PONTIAC, MICHIGAN, HOMER KINGSLEY AND F. W. NICHOLS OF EVANSTON, ILLINOIS, E. N. RHODES AND CARLETON W. WASHBURNE

OF WINNETKA, ILLINOIS, F. E. CONVERSE OF BELOIT, WISCONSIN, J. R. HARPER OF WILMETTE, ILLINOIS, OTTO W. HAISLEY OF NILES, MICHIGAN, E. P. CLARKE OF ST. JOSEPH, MICHIGAN, LEE C. RASEY OF APPLETON, WISCONSIN, P. C. EMMONS OF MISHAWAKA, INDIANA, D. J. BOONE OF LORAIN, OHIO, AND ANNA LOIS SHINN OF RIVER FOREST, ILLINOIS, ALSO TO DR. FRITZ RICHTER, HERMAN FRITCHEL, MAX FRITCHEL, GEORGE FRITCHEL, CARL PROEHL AND REV. BERGSTEDT OF WARTBURG THEOLOGICAL SEMINARY AT DUBUQUE, IOWA, OTTO MEES, PRESIDENT OF CAPITAL UNIVERSITY, COLUMBUS, OHIO, J. E. WILLIAMS, ARTHUR J. BOWEN AND ALEXANDER SMALL OF THE UNIVERSITY OF NANKING, CHINA, JOHN F. SHEPARD AND A. S. WHITNEY OF THE UNIVERSITY OF MICHIGAN, C. M. STEFFENS OF UNIVER SITY OF DUBUQUE, HENRY M. CROOKS OF ALMA COLLEGE, BRYAN LATHROP, COMMIS SIONER OF LINCOLN PARK, MRS. DELOS F. DIGGINS, DONOR OF CADILLAC, MICHIGAN, HIGH SCHOOL, MR. & MRS. AVERY COONLEY OF DOWNERS GROVE KINDERGARTEN AND NETTIE F. McCORMICK, BENEFACTOR OF UNIVERSITY OF DUBUQUE AND UNIVERSITY OF NANKING ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽

THE AUTHORS WISH FURTHER TO EXPRESS THEIR APPRECIATION OF THE EFFORTS OF THOSE MEN WHO AS CONTRACTORS UNDER TOOK THE CONSTRUCTION OF THESE BUILD INGS AND FAITHFULLY CARRIED ON THE WORK, AND OF THE EARNEST COOPERATION OF THE MANY CRAFTSMEN WHO CAUGHT THE SPIRIT OF THE DESIGNERS AND CON TRIBUTED THEIR THOUGHT AND SKILL TO THE FINAL RESULT ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽

THE ARCHITECTURAL AND ENGINEERING SERVICE ON THE BUILDINGS ILLUSTRATED AND DESCRIBED HEREIN WAS THE COORDINATED EFFORT DURING THE YEARS MCMV TO MCMXXV OF THE FOLLOWING:

DWIGHT HEALD PERKINS
WILLIAM KINNE FELLOWS
JOHN LEONARD HAMILTON
LAURANCE E. WILKINSON JAMES F. GERRITY
PAUL G. BURT GEORGE M. STONE
FRANK G. DILLARD WINSLOW H. FOSTER
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AND OTHERS.

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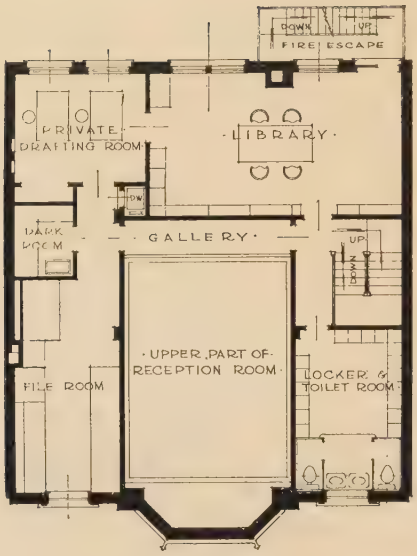
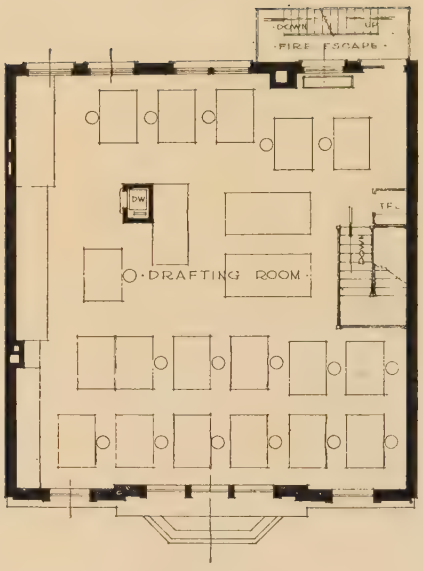
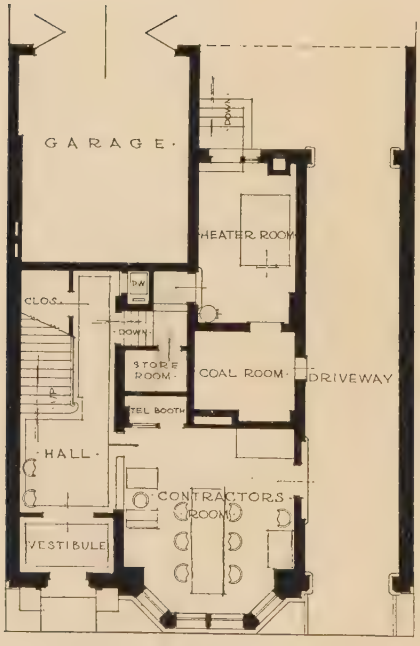


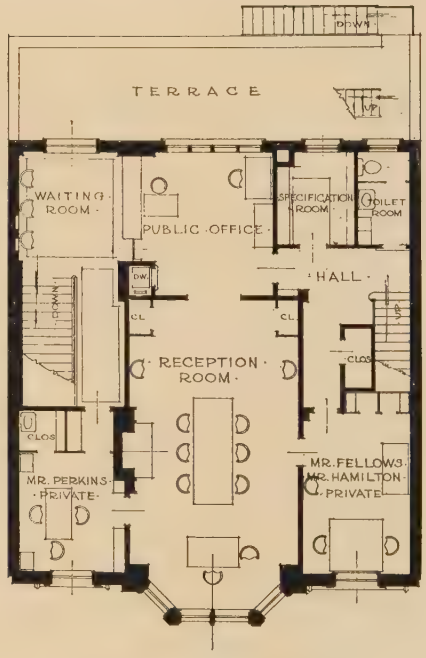
MEZZANINE



TOP FLOOR



GROUND FLOOR PLAN



FIRST FLOOR PLAN

OFFICE OF PERKINS, FELLOWS AND HAMILTON

RECEPTION ROOM

LIBRARY

OFFICE OF PERKINS, FELLOWS AND HAMILTON

SECTION 1

Elementary Schools

Illustrating

Lincolnwood School, Evanston, Ill.
Oakton School, Evanston, Ill.
Edward S. Bragg School, Fond du Lac, Wis.
Hubbard Woods School, Winnetka, Ill.
Hawthorne School, Elmhurst, Ill.
Longfellow School, Lorain, Ohio.
Elmer R. Webster School, Pontiac, Mich.
Lincoln School, Hammond, Ind.
Skokie School, Winnetka, Ill.
Arthur H. Howard School, Wilmette, Ill.
Roosevelt School, River Forest, Ill.
Kindergarten Building, Downers Grove, Ill.
Waterman School, Beloit, Wis.

Designed by

PERKINS, FELLOWS AND HAMILTON

Architects, Chicago

Elementary Schools

OF the examples of elementary schools here shown many are of the one story type advanced by the authors in 1912 as being an economical solution of the elementary school building common to small suburban towns and communities.

This problem calls for extreme flexibility in construction by units or sections, possibly beginning with only four class rooms but providing for a well regulated and orderly expansion by many stages until a school of twenty or more class rooms with assembly hall and gymnasium is reached. With this type of building small or large extensions may be constructed with the least possible interference with the conduct of the institution. In all of these one story buildings except the Webster School in Pontiac, the class rooms are skylighted and each skylight is fitted with revolving metal sunshades adjustable to exclude or admit the direct sunlight.

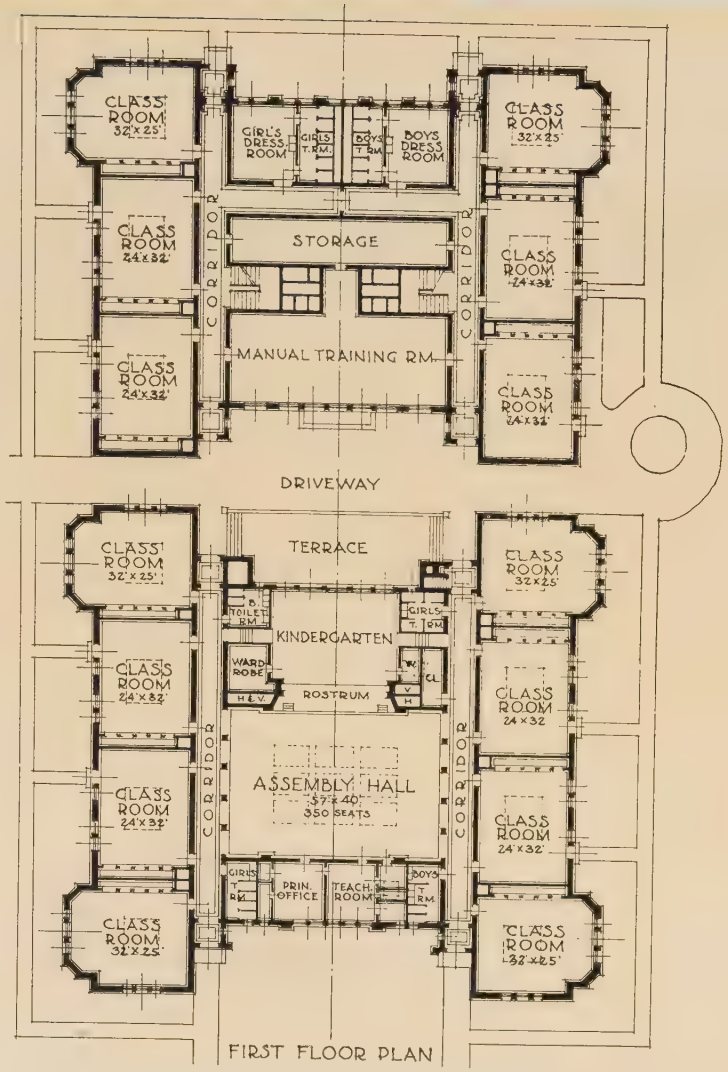
Two buildings of this type, the Skokie School in Winnetka and the Webster School in Pontiac, have been designed and built of large size and have demonstrated the practicability of this type for such buildings. In all cases where this type has been applied by the authors large areas of low priced well drained level land were available for school sites. These conditions are considered prerequisite to the selection of this type of building.

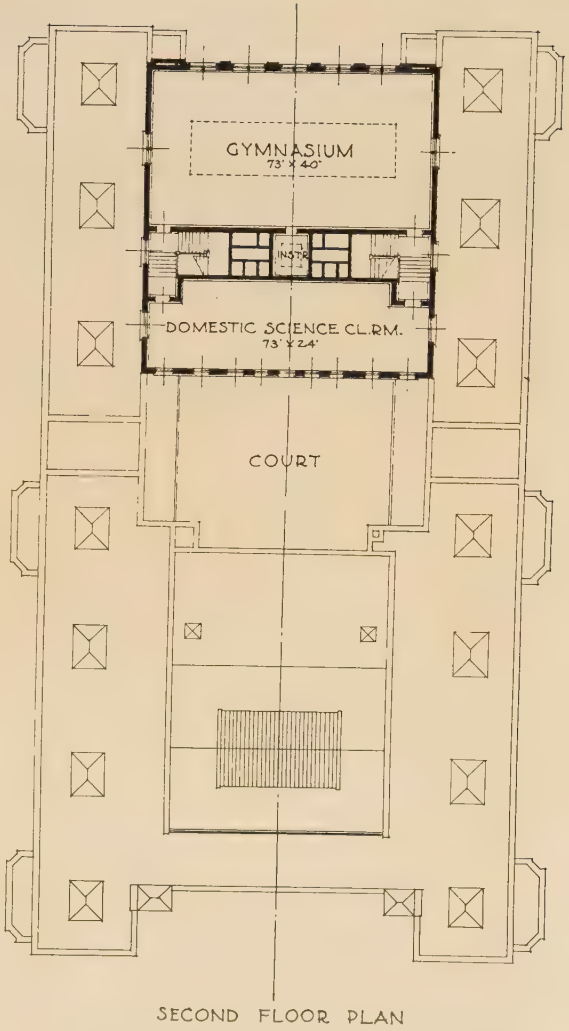
The costs per cubic foot and per pupil of these buildings do not differ materially from the cost of

housing the same number of pupils with equal safety in buildings of two or three stories. The safety provisions in the higher buildings, such as fireproof floor construction, larger corridors, and steel or concrete stairways, offset in cost the added foundation and roof construction and added cost of heating plant in a one story structure. The one story type of school has proved to be the more harmonious and welcome structure in a neighborhood of detached residences than the more formal and conspicuous buildings of greater height. On the other hand where a striking institutional character is to be expressed on the exterior the result is difficult to attain with a structure entirely one story in height. The Oakton, Bragg, Waterman, Howard and Roosevelt buildings are two story solutions of the same problem. They undoubtedly each possess a degree of architectural expression not possible to attain in one story buildings of the same size.

The Lincolnwood School, at Evanston, Ill., was one of the first of the one story type introduced and was built in two sections; the first built in 1913 contains eight skylighted class rooms east and west of the central assembly hall, kindergarten stage on the south, and offices on the north.

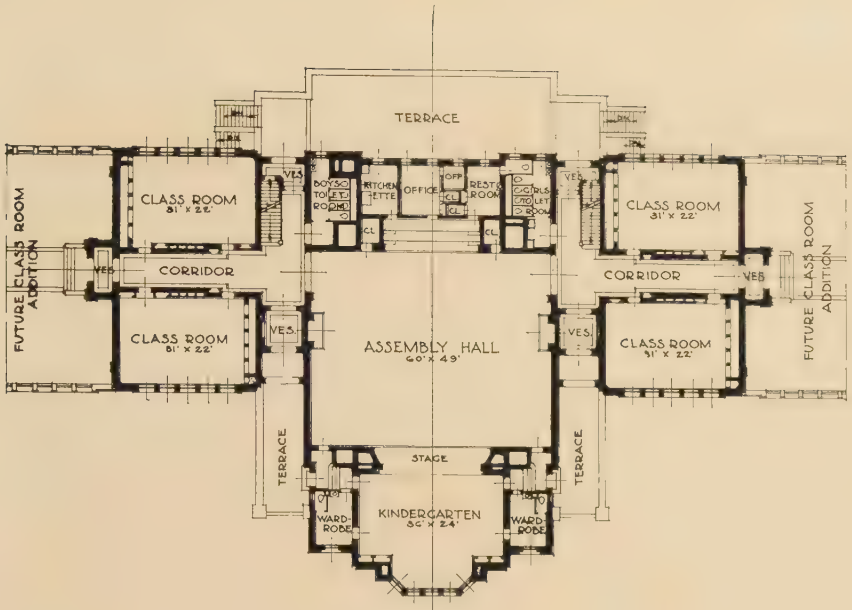
South Section Lincolnwood School, Evanston, Ill., showing two story Gymnasium Section.





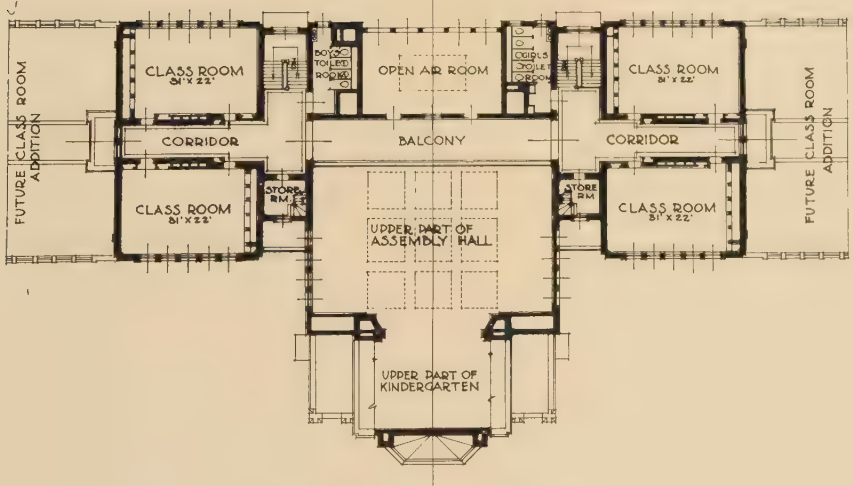
The Lincolnwood School contains 250,000 cubic feet and cost twenty cents per cubic foot. The combined building shows a cost of $300.00 per pupil. (For illustration of assembly hall interior see page 218.) The second section of this building was built in 1919 at a cost of $130,000.00, contains 546,000 cubic feet and cost forty-two cents per cubic foot. (For illustration of gymnasium interior see page 190.)

The Oakton School, on Ridge Boulevard, in the southern school district of Evanston, was built in 1914. Its location is prominent and the fine planting and care of the grounds has attracted much notice to it. For illustration of the interior of Assembly Hall see page 221.



FIRST FLOOR PLAN

SCALE IN FEET



SECOND FLOOR PLAN

SCALE IN FEET

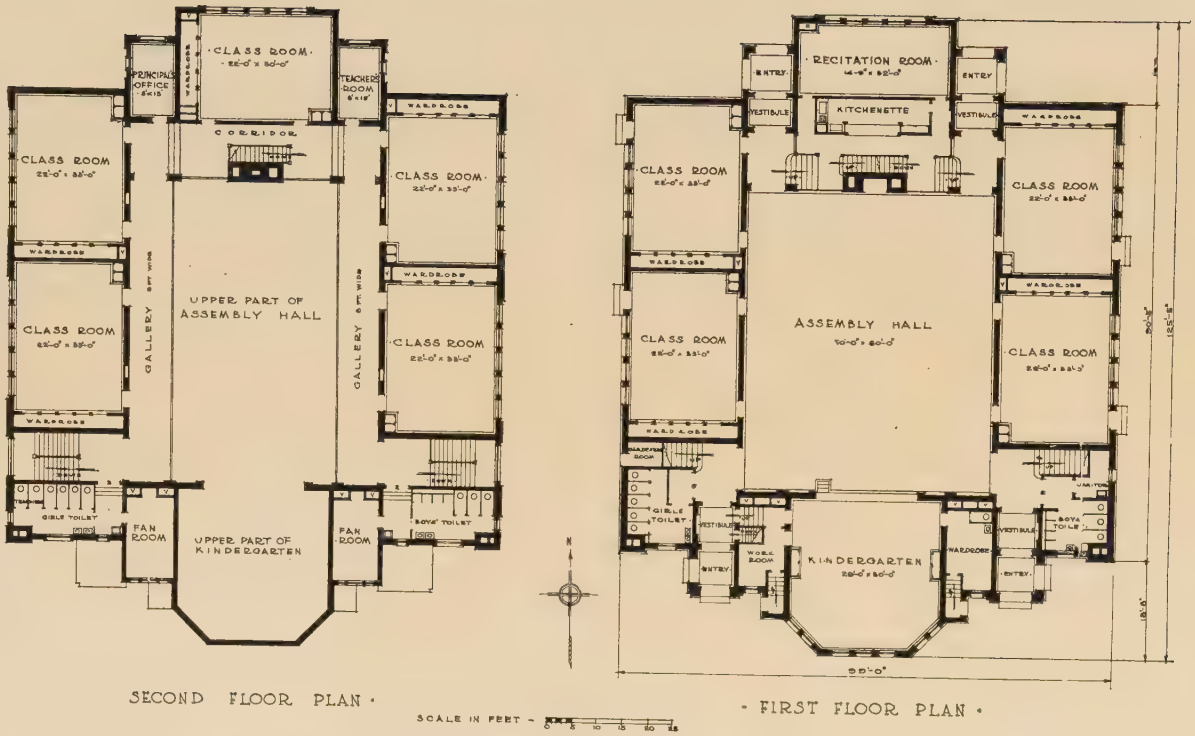
THE OAKTON SCHOOL

EVANSTON ILLINOIS

PERKINS FELLOWS AND HAMILTON-ARCHITECTS

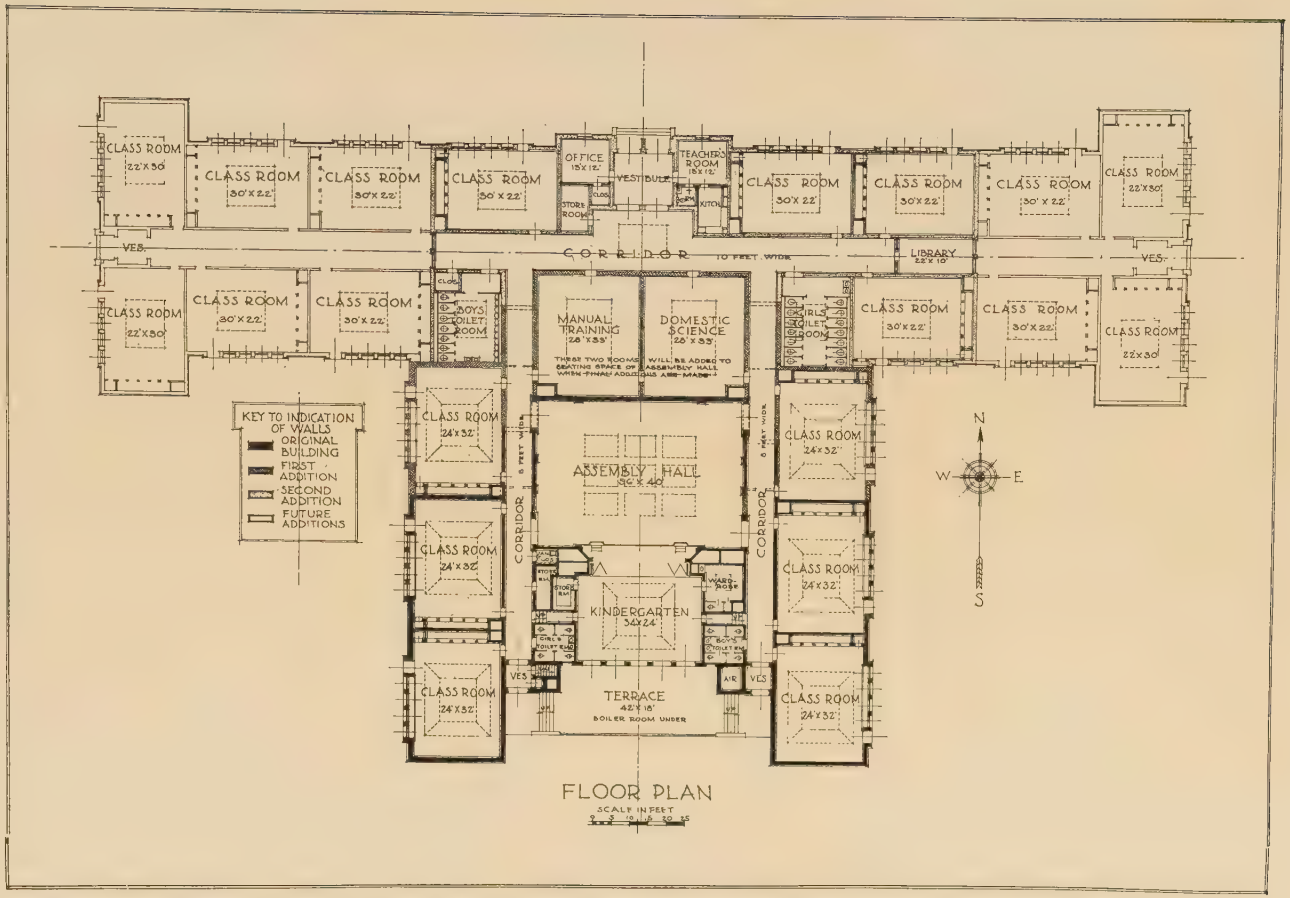
The Oakton School cost $90,000.00 and contains 405,000 cubic feet, which indicates a cost rate of 21½ cents per cubic foot or $220.00 per pupil. The present structure constitutes the first section of a building containing eighteen or more class rooms.

The Edward S. Bragg School, at Fond du Lac, Wis., was built in 1914. The building contains virtually no corridors, all corridor space having been incorporated in the Gymnasium-Assembly Hall combination and the Kindergarten is combined with the stage for use with the Assembly Hall on special occasions.



The Edward S. Bragg School, at Fond du Lac, Wis., accommodates 440 pupils in eleven class rooms and contains a large combination Assembly Hall-Gymnasium in the center of the building. It was built at a cost of $48,000.00 or fifteen cents per cubic foot. The cost per pupil was $107.00. For interior of Gymnasium see page 181.

The Hubbard Woods School, at Winnetka, Ill., is a building designed for construction in units or installments, three such sections having been constructed, one more now under construction and still another required to complete the school. Each installment is shown by distinguishing indications on the plan. For interior of Assembly Hall see page 219.



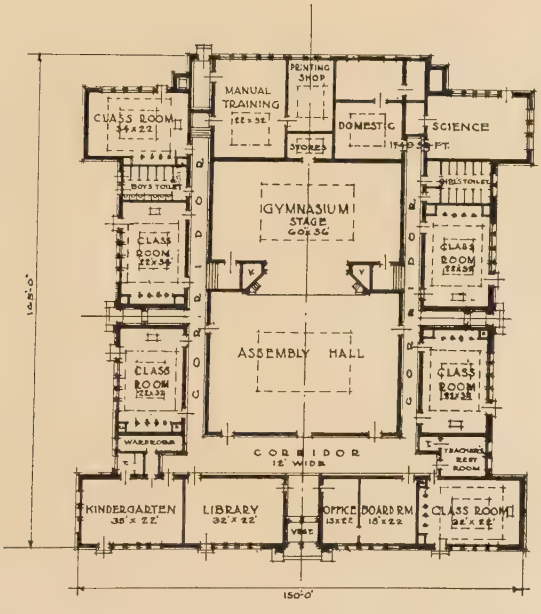
Hubbard Woods School. The cost of the first section in 1915 was $35,000.00 or 17½ cents per cubic foot. The cost of the second section in 1919 was $17,000.00 or 24.7 cents per cubic foot. The cost of the third section in 1923 was $57,000.00 or 41.2 cents per cubic foot. The cost of the fourth section in 1925 was $65,000.00 or 39 cents per cubic foot. Estimated cost per pupil in completed building is $262.00.

All class rooms in the Hubbard Woods School are lighted principally from overhead by large skylights and secondarily from side windows. Skylighting is regulated by revolving metal sun shades adjusted to the proper angle to exclude the direct rays of the sun. Portable furniture is used throughout and arranged in a variety of ways made possible only by the overhead lighting.

The Waterman School at Beloit, Wis., was constructed in 1919, at a cost of $83,000.00 for the portion built. The completed building is designed to contain 18 rooms and an Assembly Hall. The cost per cubic foot of the portion built was 24.8 cents.

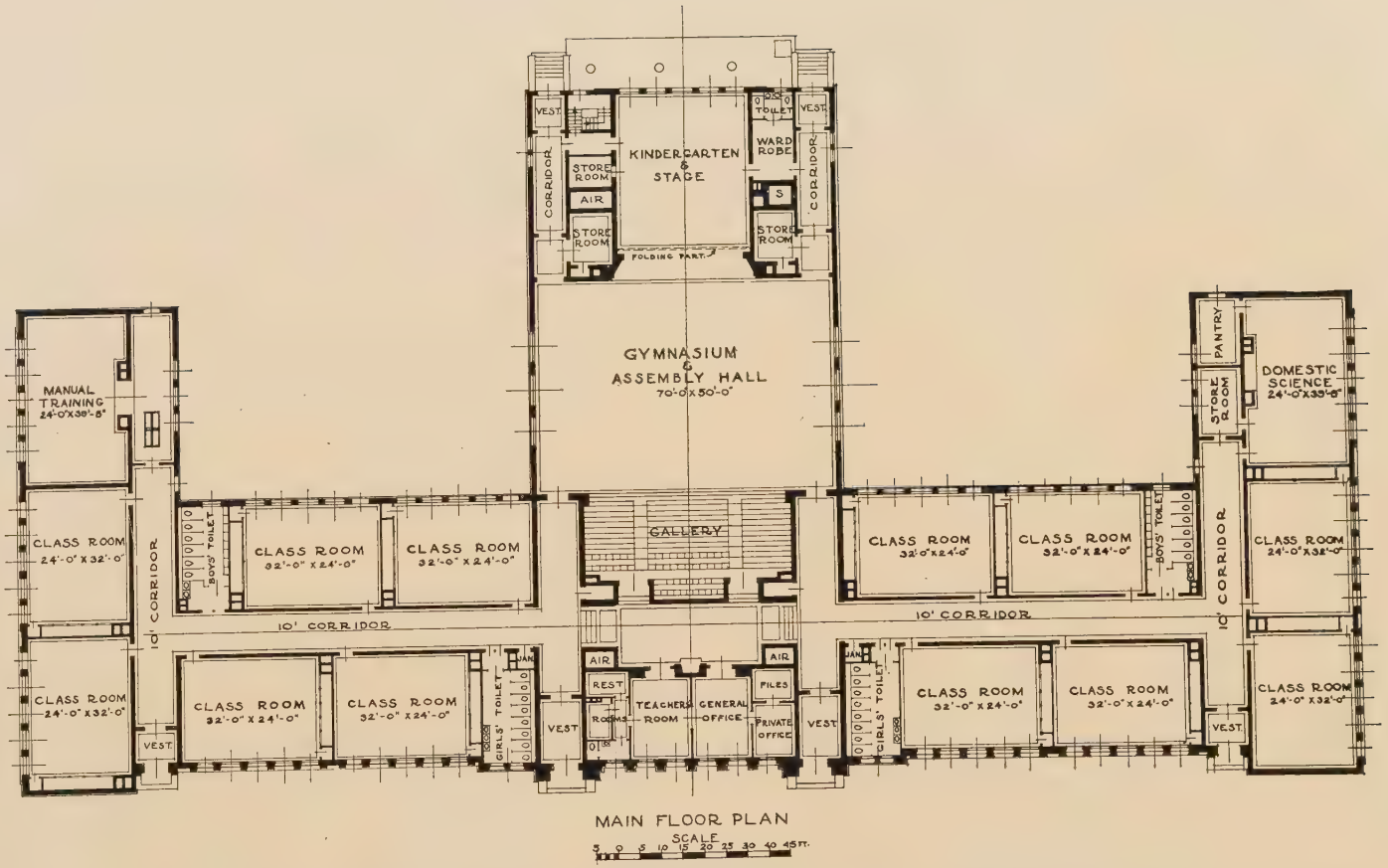
Fire destroyed the old two story School in Elmhurst, Ill., and emphasized the danger in non-fireproof buildings of that type. The Board of Education then adopted the one story type of plan with skylighted class rooms. The Stage in this building is combined with the Gymnasium. The building is a fireproof construction excepting the roof and ceiling, and main corridor exits are supplemented by outside entrances from each room. For the interior illustration of Assembly Hall, see page 29.

Interior of Assembly Hall.



MAIN FLOOR PLAN

The total cubic contents of the Hawthorne School, including a small portion not yet built, is 425,000 cubic feet. The cost in 1918 was 23.1 cents per cubic foot. The total cost of the building as completed will be $110,000.00 or $300.00 per pupil.

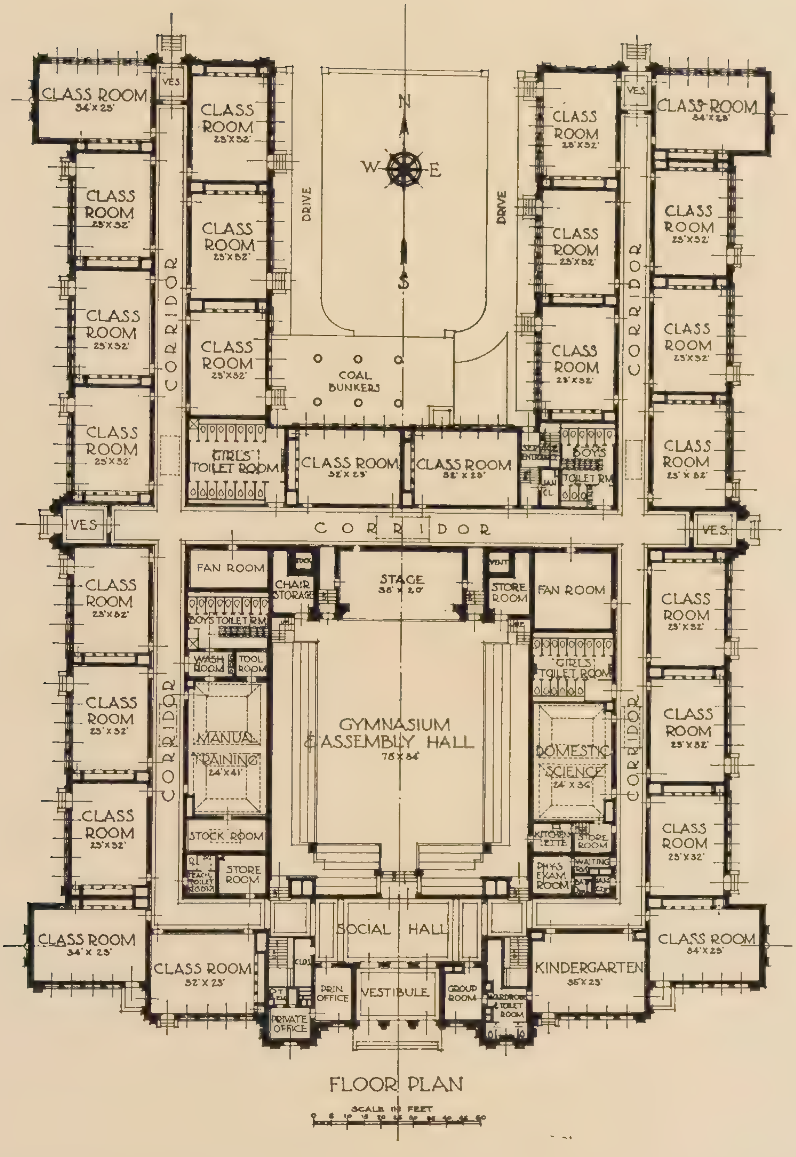


MAIN FLOOR PLAN

The Longfellow School, at Lorain, Ohio, contains in the portion now built 762,000 cubic feet. Its total cost was $300,000.00, showing a cost of about 40 cents per cubic foot or $600.00 per pupil.

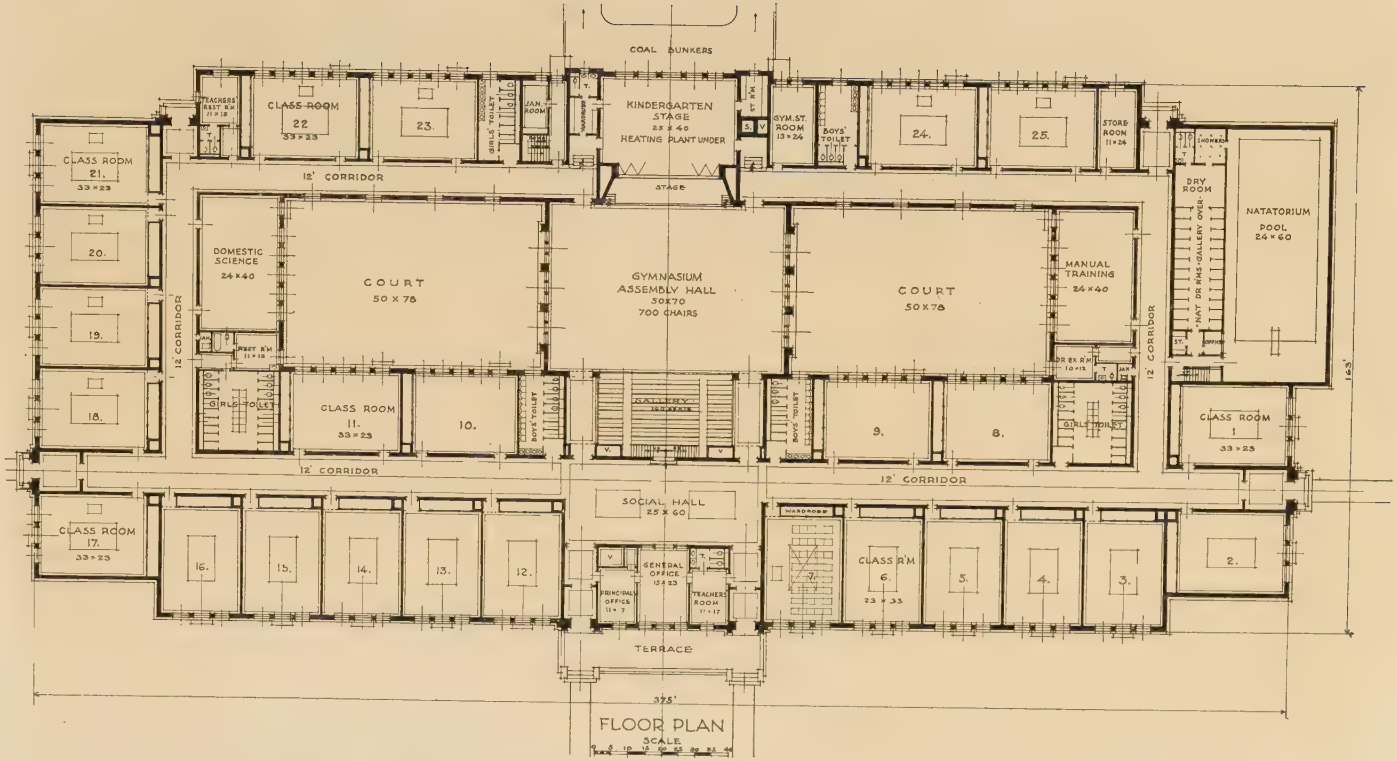
The Longfellow School in Lorain, Ohio, was constructed in 1921, near the eastern boundary of that city and close to the model village built during the war by the United States Shipping Board. It, fortunately, escaped damage in the great tornado, which almost completely wrecked the central portion of the city.

The Elmer R. Webster School in Pontiac, Mich., is an example of a large elementary school building of but one story. The second story in the center over the entrance is of minor importance and contains only library and rest rooms. The combination Gymnasium and Assembly Hall, and the Manual Training and Domestic Science Departments are placed in the center of the plan and are surrounded by the corridors in the class room sections. This building differs from other one story schools herein illustrated in that all class rooms are lighted from side windows only.



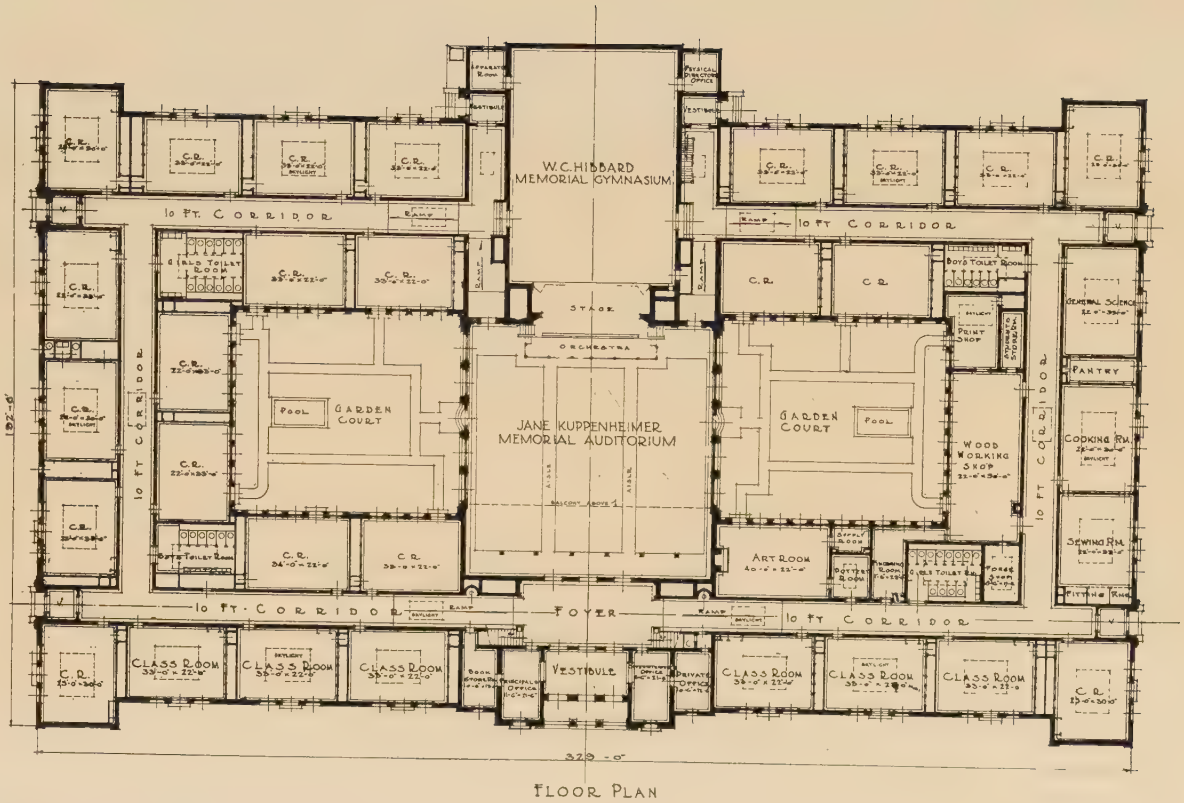
The Elmer R. Webster School has a total cubic contents of 918,000 cubic feet. The cost in 1919 and 1920 was $335,000.00 or 36.5 cents per cubic foot or $387.00 per pupil. For illustration of Gymnasium-Assembly Hall see page 184.

The Lincoln School at Hammond, Ind., is an economical type of one story building, designed for an industrial community. Its unique features are the class rooms lighted from windows in the ends and from skylights in the roof. A considerable saving in cost was effected by this plan.



The Lincoln School at Hammond will contain, when all sections are completed, about 1,000,000 cubic feet. Its total cost will be about $325,000.00 on a basis of $32\frac{1}{2}$ cents per cubic foot and its cost per pupil $300.00. It is of semi-fireproof construction.

The Skokie School at Winnetka, Ill., is a large elementary school of the one story type and designed to accommodate nine hundred pupils when completed. It was built in 1921 with funds raised by a popular subscription of the people of the Village of Winnetka who rallied to meet the emergency caused by the rapid growth of school attendance and the exhaustion of the bonding power of the district as provided by law.

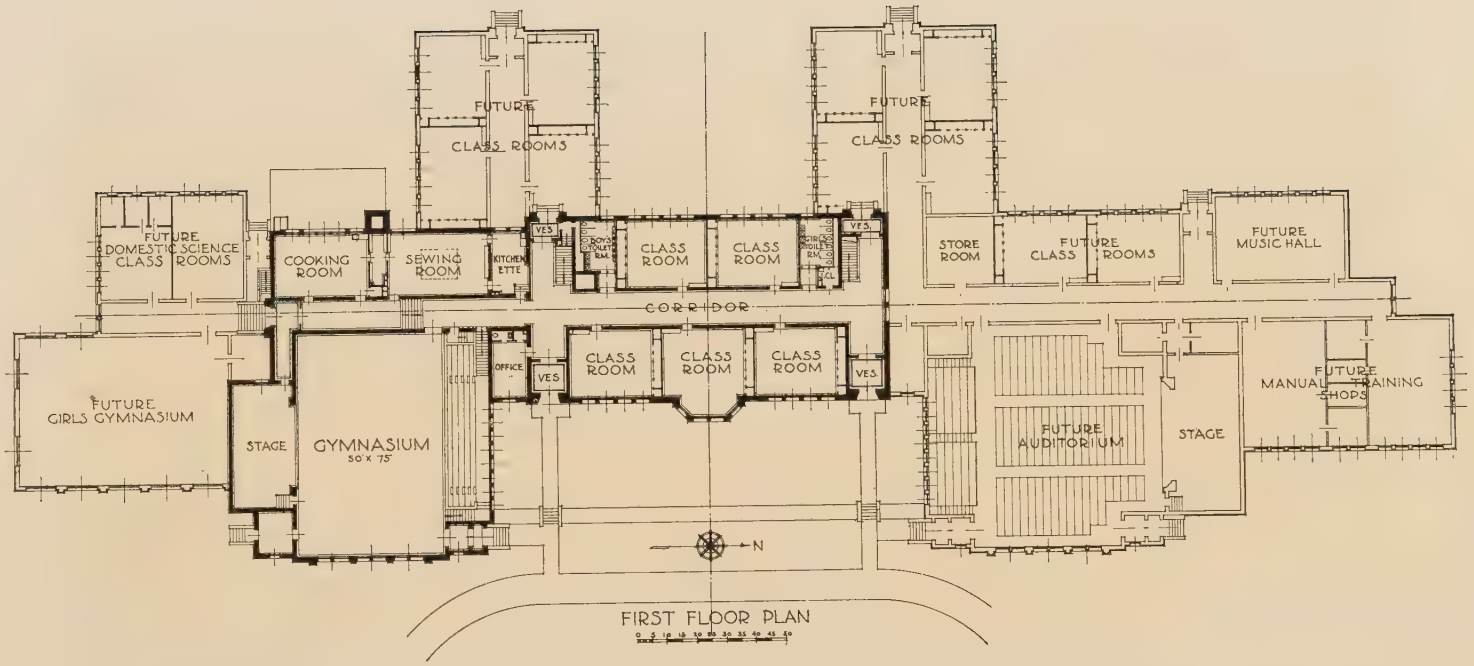


FLOOR PLAN

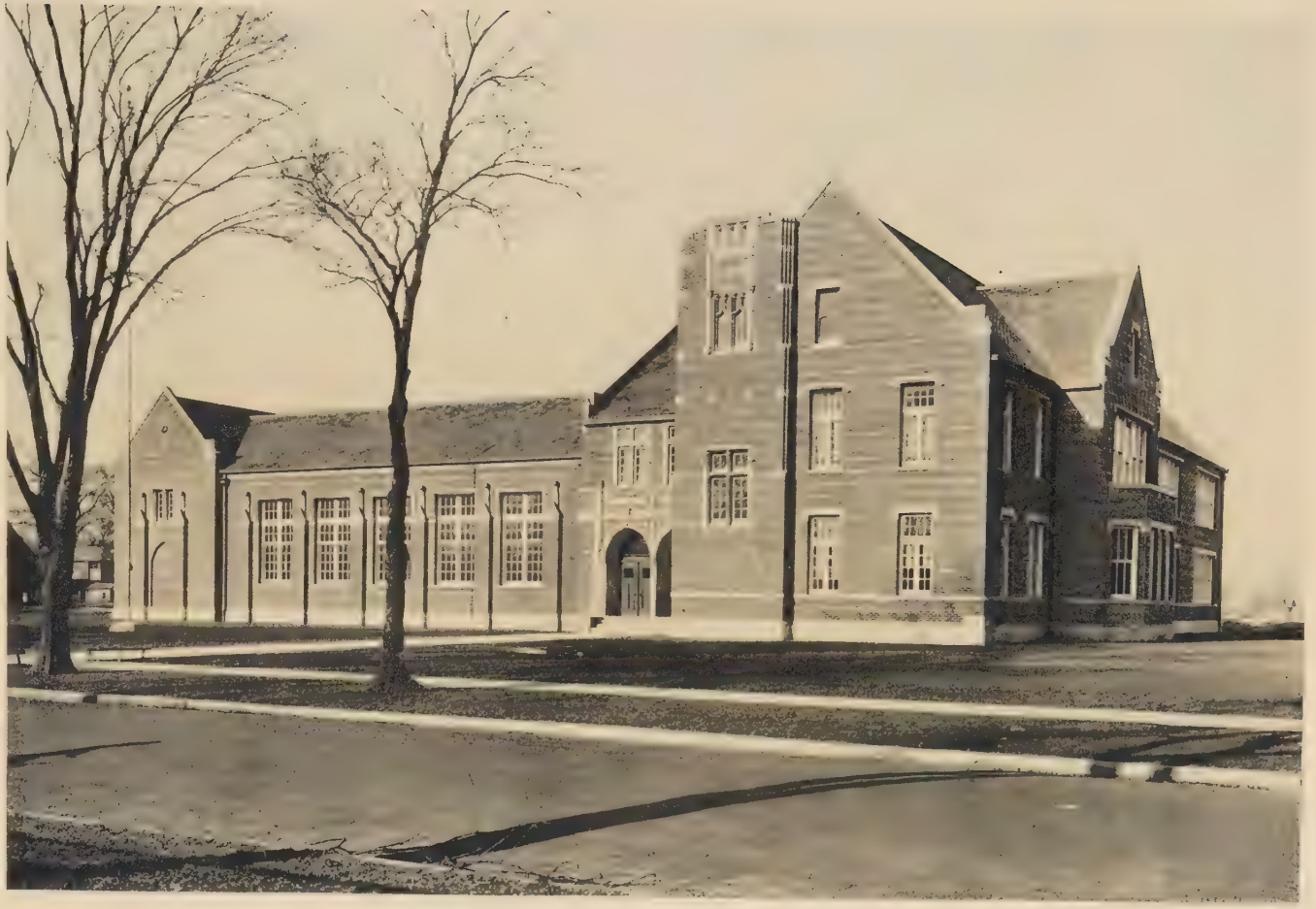
The Skokie School is operated under the departmental plan as a junior high school but without the ninth grade—no legal provision for junior high schools having been provided in Illinois outside of Chicago. This institution is now attracting much notice as the scene of development of the Winnetka method of individual instruction. For interior illustration of the Jane Kuppenheimer Memorial Auditorium in the Skokie School, see pages 206 and 207. The central portion and the section north of it, containing a total of 880,000 cubic feet, have been built at a cost of $320,000.00. or at a unit rate of 36.3 cents per cubic foot. The completed structure will contain 1,200,000 cubic feet and will have cost about $460,000.00, establishing a rate of about $500.00 per pupil for this building.

The Skokie School, when completed, will contain two of these garden courts, one on either side of the Auditorium. The concrete pool is used as an aquarium, as an aid in the study of natural science and for the use of boys in the Manual Training Department in testing small boat models. At the Skokie School are in attendance all pupils of the sixth, seventh and eighth grades of the entire school district, in addition to the pupils of five lower grades from the immediate neighborhood.

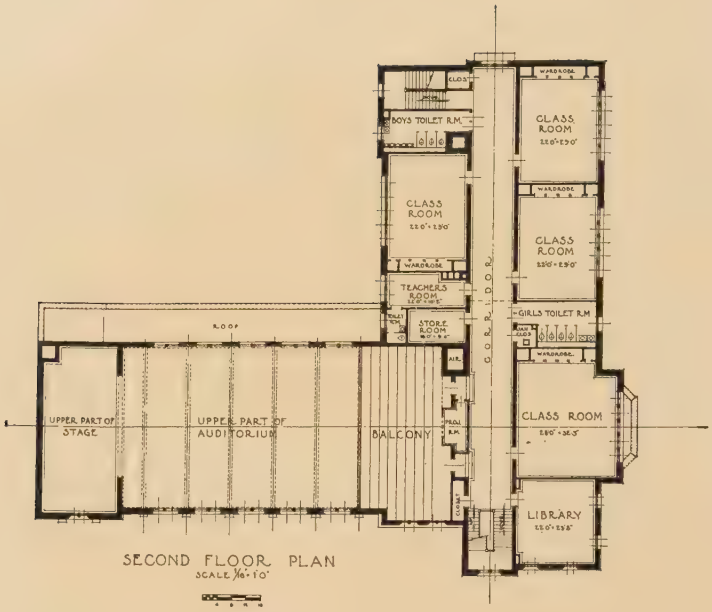
The Arthur H. Howard School, in the western portion of the Village of Wilmette, Ill., is a result of a cooperative effort of the Board of Education and the Corporate Village, whose authority was combined to establish an educational and recreational center on a beautiful sloping site several acres in extent. As this is the initial portion of a future building of much larger size, the indicated cost per pupil is high. The building, after completion, was given the name of the late Arthur H. Howard, who, as President of the Board, showed great interest and activity in the consummation of the project.



The Arthur H. Howard School was constructed in 1923 at a cost of $165,000.00, showing a unit price of 28 cents per cubic foot or $460.00 per pupil at present accommodated. For interior illustration of the Gymnasium, see page 184.

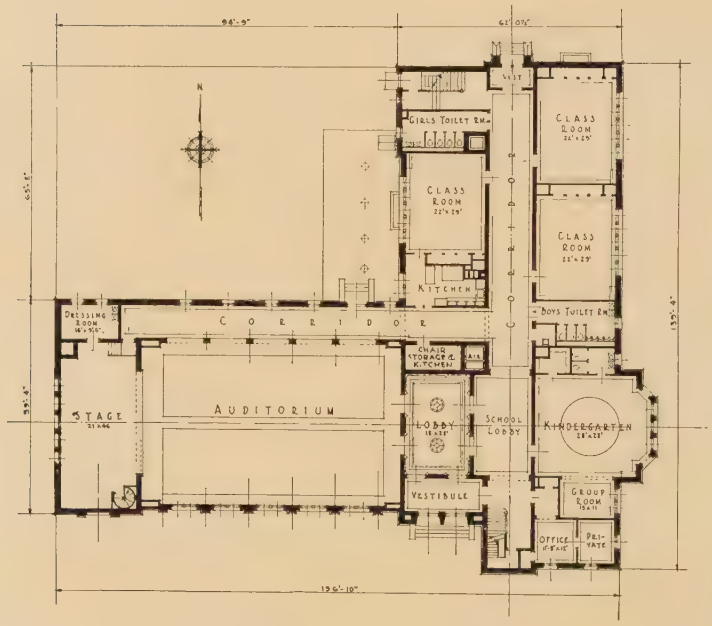


The Roosevelt School and Memorial Hall at River Forest, Ill., was built by the Board of Education with the aid of the Soldiers Memorial Association, who raised a portion of the funds for the construction of the Assembly Hall and the marble Foyer through which the Hall is entered and which is dedicated as a memorial to the men who left their homes in River Forest to participate in the world war. An ideal kitchen equipment convenient to the Assembly Hall is provided for the purpose of serving three hundred people in the Hall. For illustration of interior of Assembly Hall, see page 220.



SECOND FLOOR PLAN

SCALE 1/16" TO 1'



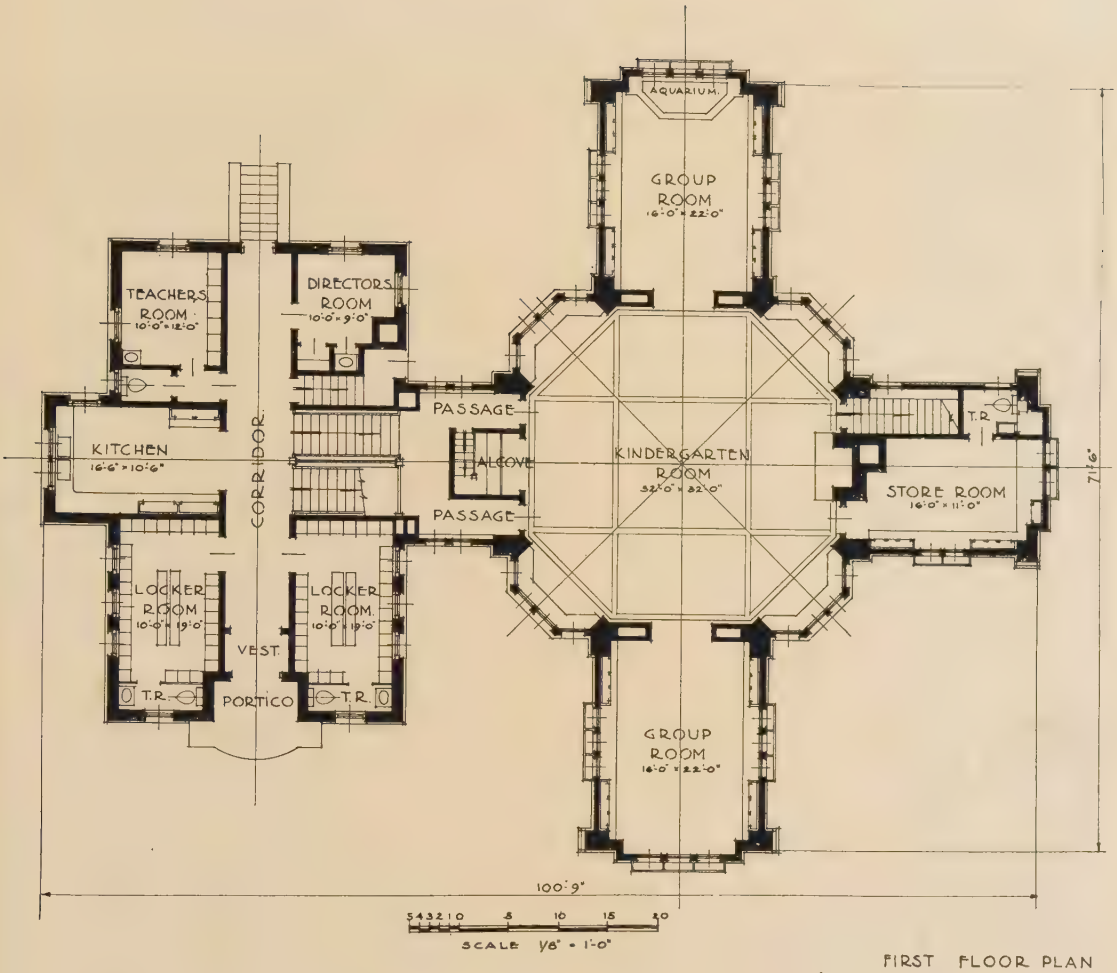
FIRST FLOOR PLAN

SCALE 1/16" = 1'-0"

The Roosevelt School was built in 1924 at a total cost of $208,000.00. It contains 556,000 cubic feet, showing a unit cost of 37½ cents per cubic foot or $722.00 per pupil. The construction of the building is entirely fireproof except the roof.

The Main Entrance of the Roosevelt School is an interesting bit of detail modeled by Mr. Emil Zettler.

The Downers Grove Kindergarten. This building is a private philanthropic enterprise of Mrs. Avery Coonley, of Riverside, Ill., who has built and continues to conduct such kindergarten schools in Riverside, Brookfield and Downers Grove, all western suburbs of Chicago. Mrs. Coonley is a believer in small classes, particularly in the kindergarten. Her theory is that thirty is the maximum and that this number requires three teachers. Her kindergartens are, therefore, conducted strictly on this basis.



FIRST FLOOR PLAN

The Downers Grove Kindergarten has two class suites, one above the other and each consists of a central octagonal or circle room with large corner bays, group rooms adjoining it on opposite sides and an ample store room for kindergarten supplies opposite the entrance to the room. Each of these suites is intended to accommodate thirty pupils. The building is placed on a hillside and the lower level of the serving section is midway between the two kindergarten floors. The service section contains a kitchen, teachers' room, directors' room and locker and toilet rooms for the pupils.

A GROUP ROOM

Each of the circle rooms in the Downers Grove Kindergarten contains a large brick fireplace and a small alcove with piano built in and a little raised gallery for the juvenile singers behind it.

The building was constructed in 1912 at a cost of $26,000.00.

SECTION II

Junior High Schools

Illustrating

David Worth Dennis Junior High School,
Richmond, Ind.

Julia E. Test Junior High School,
Richmond, Ind.

Thomas L. Handy Junior High School,
Bay City, Mich.

Theodore Roosevelt Junior High School,
Appleton, Wis.

Woodrow Wilson Junior High School,
Appleton, Wis.

Designed by

PERKINS, FELLOWS AND HAMILTON

Architects, Chicago

Junior High Schools

THE design of buildings for Junior High School purposes has been necessarily co-ordinated with the development of the system of Junior High School instruction which has taken place in very recent years. In a general way it may be said that the plan of a typical Junior High School Building embraces most of the fundamental features of those of Senior High Schools but in modified form.

The Thomas L. Handy Junior High School of Bay City more nearly approaches a Senior High School in the completeness of its accessory equipments such as auditorium, gymnasium, natatorium and manual training than is generally understood to be required of a Junior High School Building.

The Roosevelt and Wilson Junior High Schools at Appleton, Wisconsin, can be considered as more typical for that type of institution. The gymnasiums and assembly halls are not large but quite simple in their provisions. Manual training is provided for only in its elementary stages.

The David Worth Dennis and Julia E. Test Junior High Schools of Richmond, Indiana, were built after the Junior High School system had been in full operation and development in Richmond for a long period of years and was subjected to very careful study by those in charge.

In order that the educational principles underlying the designs of these two buildings be better understood, the article by Mr. J. H. Bentley, former superintendent of schools of Richmond, describing them, which appeared in the American School Board Journal in 1922, is quoted as follows:

Richmond began to develop its junior high school in 1895. By 1910 it had reached a stage where the work of the 7th and 8th grades was departmentalized and these classes grouped in a building apart from the six lower grades and the four year high school above. At first the subject matter was largely the same as it had been in the older organization but between 1910 and 1915 there was a steady reorganization which introduced into the seventh and eighth grades many of the subjects ordinarily reserved for the high school courses and which brought about a gradual change in methods of teaching from that of the older elementary school to something more nearly approaching that of the secondary school. From 1915 till now the board of education has been planning for more room for the constantly increasing enrollment and has also been looking forward to the adding of the ninth grade to the junior-high-school organization.

In this development from 1895 to the present, the school people of Richmond were feeling their way to a better plan of organization with little in the way of precedent to guide them, as the junior-high-school movement of the last few years had hardly begun. Two or three interesting facts can be noted in this connection. The departmentalized upper grades were separated from the lower grades, and it was found that the lower grades were a better social unit for school organization and administration without the presence of the seventh and eighth grades than with them. These upper grades were not attached to the high school organization and experience has shown that a type of school organization has been developed that fits these early adolescent children better than would be possible were the situation complicated by the presence of the older boys and girls.

These years of experience have made Richmond sure that the reorganization of the seventh and eighth grades should take place apart from both the pupils of the lower grades and of the upper grades as well. They are further convinced, though not by experience, that the ninth grade belongs with the seventh and eighth years, first of all, because of the average age and maturity of the pupils involved and the type of teaching suited to these ages, and also because the three years will make a better administrative unit than the seventh and eighth years alone.

So that when the board of education came to the building problem, the experience of over twenty years had practically settled the question of the type of organization for which to plan. All agreed that the 6-3-3 type was what was best for Richmond. The questions facing the board then were: How large a building, where should it be located, what should it include?

The board decided that provision must be made not only for the present junior-high-school population, but that plans must be drawn that would be capable of expansion to care for the growth of the junior-high-school population in the coming years. It further decided that the location must provide ample play space as well as opportunity for dignified and adequate architectural treatment. The buildings and grounds must be beautiful as well as ample and if possible, must express in appearance the idea of the intermediate school.

For twenty years the boys and girls of the junior high school have been going to the center of the city. It seemed more desirable, particularly for children of this age, to send them away from the business district rather than toward it. This consideration coupled with the high cost of an adequate site centrally located, led the board to look for a location on the edge of town rather than down town. This decision necessitated more than one building in order to take care of all the children without sending any of them too far to school. The board, accordingly, bought two sites, one on the east side and the other on the west side of the city.

The site on the west side for the David Worth Dennis school covers about six and one-half acres so situated that it can be enlarged later and that on the east for the Julia E. Test school between thirteen and fourteen acres. In locating these sites the board took into consideration the possible additional need of two more junior high schools and so located the present buildings that two additional buildings can be located north and south of the center of the city without serious overlapping of territory. All of the sites will be within walking distance from all parts of their districts.

In planning the buildings and laying out the site, the fundamental idea underlying every decision was that this was not an elementary school or a senior high school but a school intermediate between the two and that the building and grounds should serve the needs of such a school so far as these needs were recognized and could be realized. The board also kept constantly before it the idea of the building serving as a neighborhood or community center for children and adults.

The program of studies to be carried on in the building was first decided on and a careful estimate of the needs of this program furnished the architects. Plans as developed furnish facilities for this work and in the opinion of the authorities at Richmond are a contribution on the part of the architects not only to school architecture but to educational theory as well.

The two plans are identical in the facilities offered. The program of studies offered in the Richmond junior high school require of all pupils certain academic or book subjects, a certain amount of experience in household arts for girls and wood and metal work for boys, physical education and music and art. Possible elections allow the pupils to take more or less of these various lines of work as their abilities and inclinations may lead them to choose, but all pupils take some of all of the various kinds of work offered.

Special features of these buildings are briefly these: They are each planned to accommodate about 750 pupils, estimating 30 to 35 as classroom capacity. The board felt that 750 pupils is a large enough group to administer economically, give the elective opportunities necessary at this age and still not have so large a group together that the individual child cannot know all the faculty and the greater part of his fellow students.

This latter consideration is of very great importance to the social organization of the school. There are no so called study halls. The

school program is based on a six-period day, and with supervised study in the classroom and some assignment of the child every period of the day, the study hall is not needed.

The science laboratories are to be equipped with large tables and chairs. Water, gas and electricity will be available in the room but the ordinary science room equipment of elaborate desks will be absent, as not necessary for the type of science work suitable for these grades.

The practical-arts work for girls will carry on in a large cooking room equipped with unit kitchens consisting of four-burner, double-oven gas ranges such as are found in most homes, a sink and a kitchen cabinet. Here the girls will cook in "home" sized portions, as far as possible taking their product home for the "acid test" of home consumption.

The kitchen adjoining the lunch room will be taken care of by the girls electing additional work beyond the compulsory courses. The large dining room is divided by folded partitions into two rooms for sewing classes. This device has worked all right in practice and is a necessary building economy.

For practical arts for boys two large shops and a drawing room are provided. The general wood shop is to have opportunities for bench work, pattern making, cement and electrical work. The general metal shop is to be equipped for metal work, machine shop work, electricity, forging and foundry work. All the work is to be handled on a project basis and the only limitations to the projects selected will be the obvious physical limitations of the shop environment. No highly specialized or vocational work in the strict sense of the word will be attempted. This type of work is reserved for the senior high school and with a flexible administrative control a fourteen-year old boy who for any reason needs the vocational work is transferred promptly and easily to the senior-high-school shop. This tends also to keep the group in the junior high school and the senior high school more nearly homogenous as far as social needs are concerned.

The drawing room will not offer the formal mechanical drawing course. It is to function as a sort of reference room for projects in either shop. In getting a project under way a boy realizes the need of drawings not only to work by after the project is approved but as a means of getting the approval of the instructor before the project is started. He is therefore sent to the drawing room for enough help to get this drawing out. Mechanical drawing is thus taught as a means to an end which is its proper relationship under actual working conditions.

The work in physical education is to be organized on the game basis. Interclass contests and some interschool contests will be encouraged but nothing on the scale of the interscholastic contests of the upper school will be allowed. To this end the gymnasiums are simply large airy play rooms with a small gallery and no running track and equipped with a minimum of apparatus. The boys' gymnasium in each school makes provision for spectators but only up to a possible 400. A necessary adjunct to the gymnasiums are the outdoor play fields which em-

brace a standard quarter-mile running track, tennis, volley ball, basket ball, and hand ball courts together with baseball and football fields. These fields will have concrete grandstands under which will be showers and locker rooms for men and women. This will make the outdoor playground independent of the indoor and make it easier for the gymnasiums and fields to be used by the adults in the neighborhood as well as by the children in the schools. Each school is to be provided with a natatorium. All the gymnasiums and swimming pools are so grouped that they can easily be used without regard to the rest of the building.

These two completely equipped athletic fields are to function in the summer time playground program by providing places for organized play for the older boys and girls, thus leaving the playgrounds around the elementary schools for the use of the smaller children who enjoy the simpler games and the use of the playground apparatus.

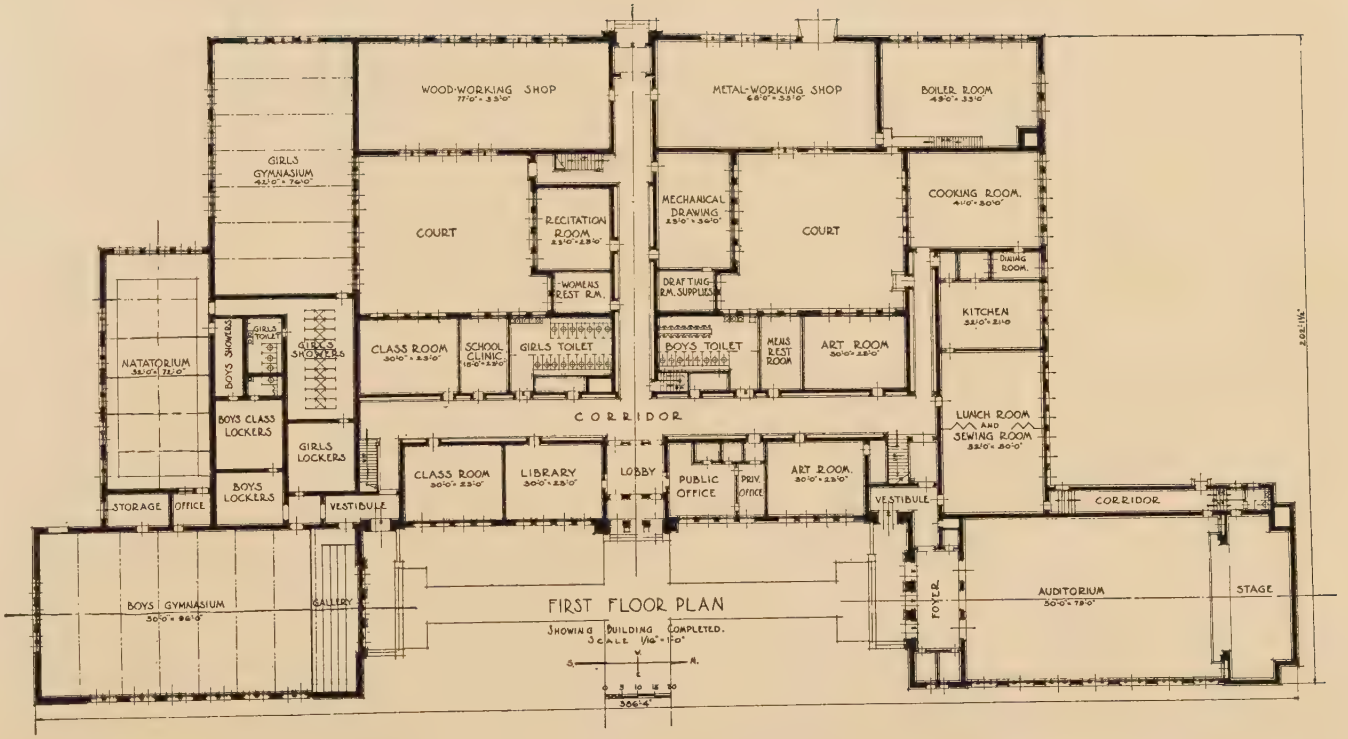
The auditoriums in each building are planned for 750 seats on the floor and are without galleries. Each has a stage large enough for a chorus of from 150 to 200 voices. These stages are not to have flies but will have ample room for the staging of plays suited to the age of the children and will allow room for the storage of simple sets of scenery on either side. During school hours the music classes will meet in the auditorium and the orchestra will rehearse there after the school hours. Each auditorium is equipped with dressing rooms, toilet facilities, separate heating and ventilation so that they can be used by the neighborhood without opening the rest of the building.

The David Worth Dennis includes two courts that can be set to grass and shrubs because of their size and because the building around them is only one story in height on two sides of the court thus guaranteeing plenty of sunshine. One of these will open off of the girls' gymnasium and will form an outdoor exercise room; the other opening off a corridor near the kitchen will lend itself to evening parties. In the east side plan the girls have a similar exercise field opening off the gymnasium and the forecourt offers many opportunities for pageants, etc.

Not only has the board tried to build buildings suitable to the junior-high-school work in the interior arrangement of its proposed buildings but it has sought in the outside appearance to express as far as possible the idea of the intermediate school. To this end it adopted a plan that combines the one and two-story types of construction and has sought so far as possible to get a building that would not have the conventional public school appearance.

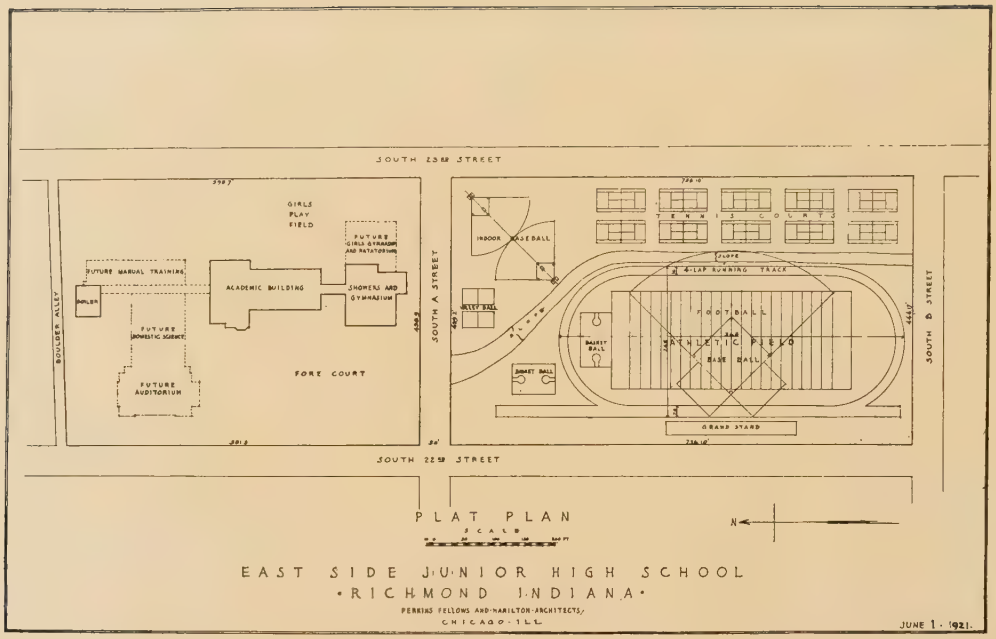
In conclusion, Richmond has, because of her experience of over twenty years, settled on the 6-3-3 plan of organization for her school system; she feels that there are three distinct groups among her children that need a different environment and a different curriculum content for their proper education. In her new junior high schools she is planning for units of about 750 housed in buildings of the one and two-story type that provide education of a kind different from the years before and the years after, and is attempting to express this difference by their interior arrangement and their exterior appearance. How well she will succeed, only the experience of the next few years can tell.

The David Worth Dennis School at Richmond, Ind., is one of the two junior high schools of the city. It is a building of Renaissance design, fireproof brick and stone construction. It consists of a main or academic section with attached wings containing the Auditorium and the Gymnasium. The building is placed on a large site and ample provision for expansion to provide for future growth is made. For interior illustration of Gymnasium see page 189. For interior of Auditorium see page 210.

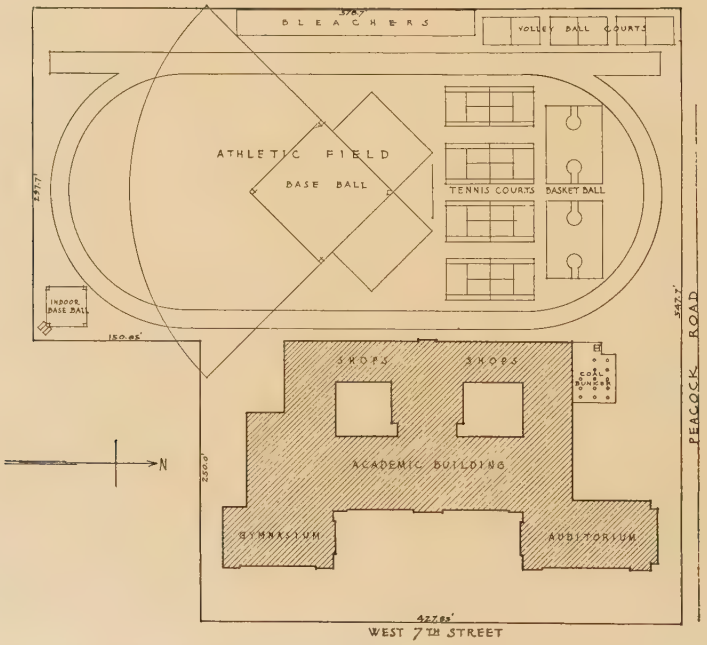


The David Worth Dennis Junior High School at Richmond, Ind., was constructed in 1921, omitting Natatorium, Girl's Gymnasium and Manual Training Shops and comprised a building containing 1,008,000 cubic feet, which cost $400,000.00 showing a unit price of 39.5 cents per cubic foot or $800.00 per pupil.

The Main Entrance, David Worth Dennis Junior High School, Richmond, Ind.

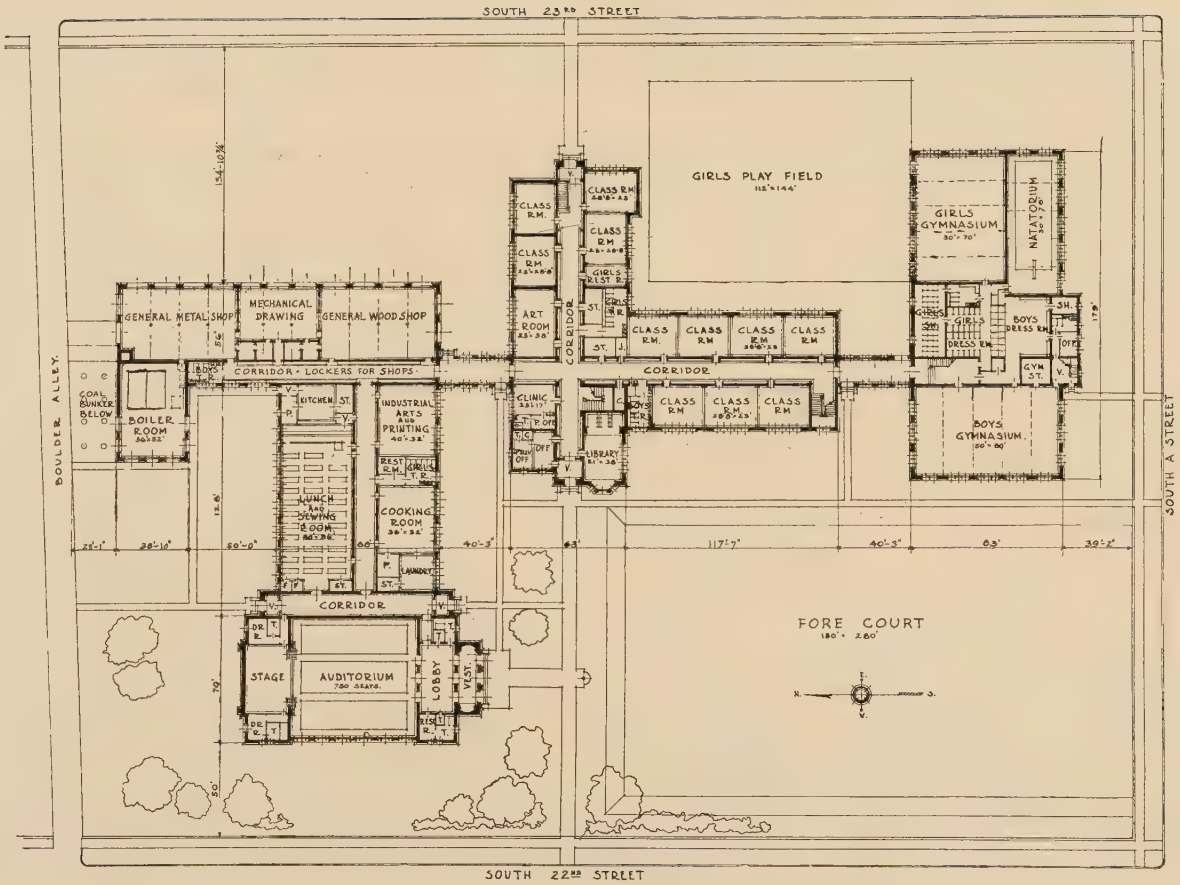


Plan of Grounds, Julia E. Test Junior High School, Richmond, Ind.



Plan of Grounds, David Worth Dennis Junior High School, Richmond, Ind.

The Julia E. Test Junior High School at Richmond, Ind., was constructed in 1923. The portion built included the Academic Section, omitting the east wing; the Gymnasium Section, omitting girls' gymnasium and Natatorium and the Boiler House. The Auditorium and Industrial Arts Sections have not as yet been constructed. The building is designed in the English Gothic style and is on a large and prominent site. It is of fireproof construction throughout and is equipped with steel windows. For interior of Gymnasium see page 189.

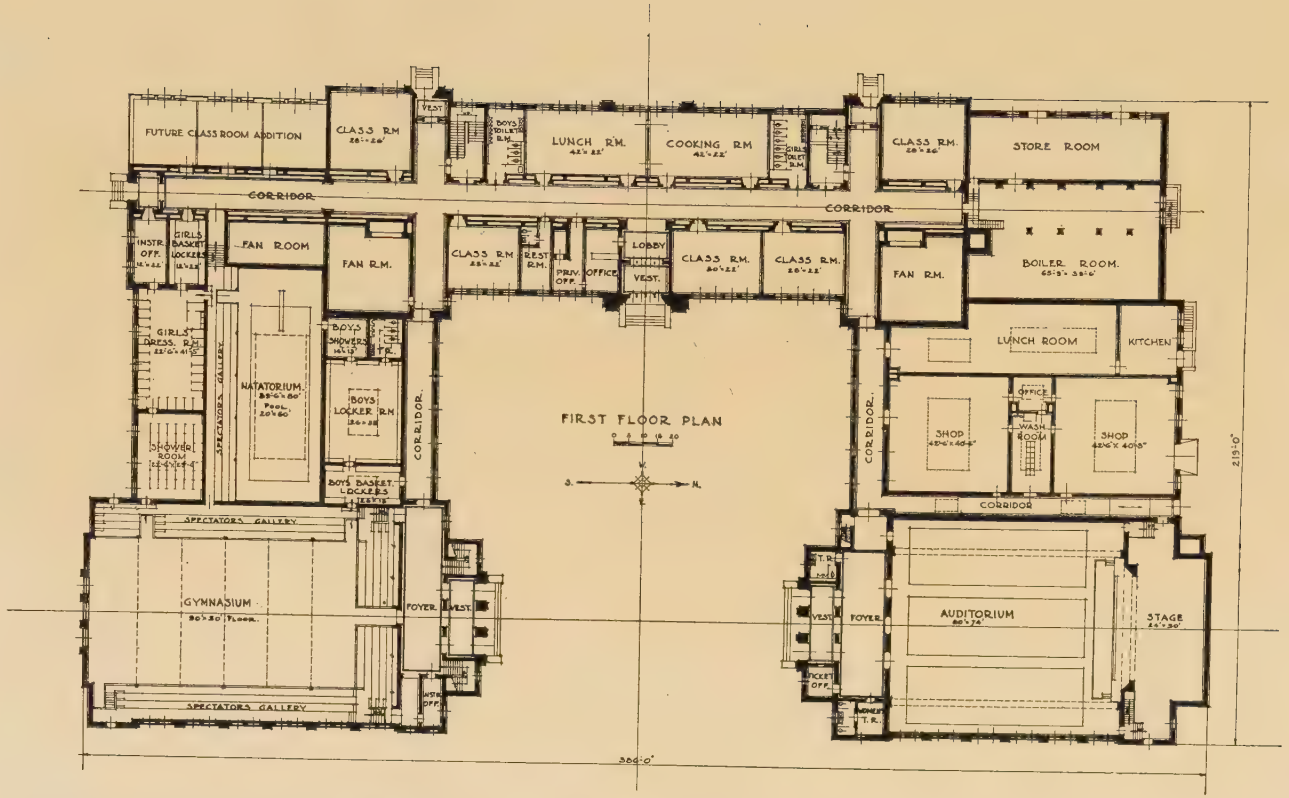


GROUND FLOOR PLAN.
SCALE 1/32"=1'0"

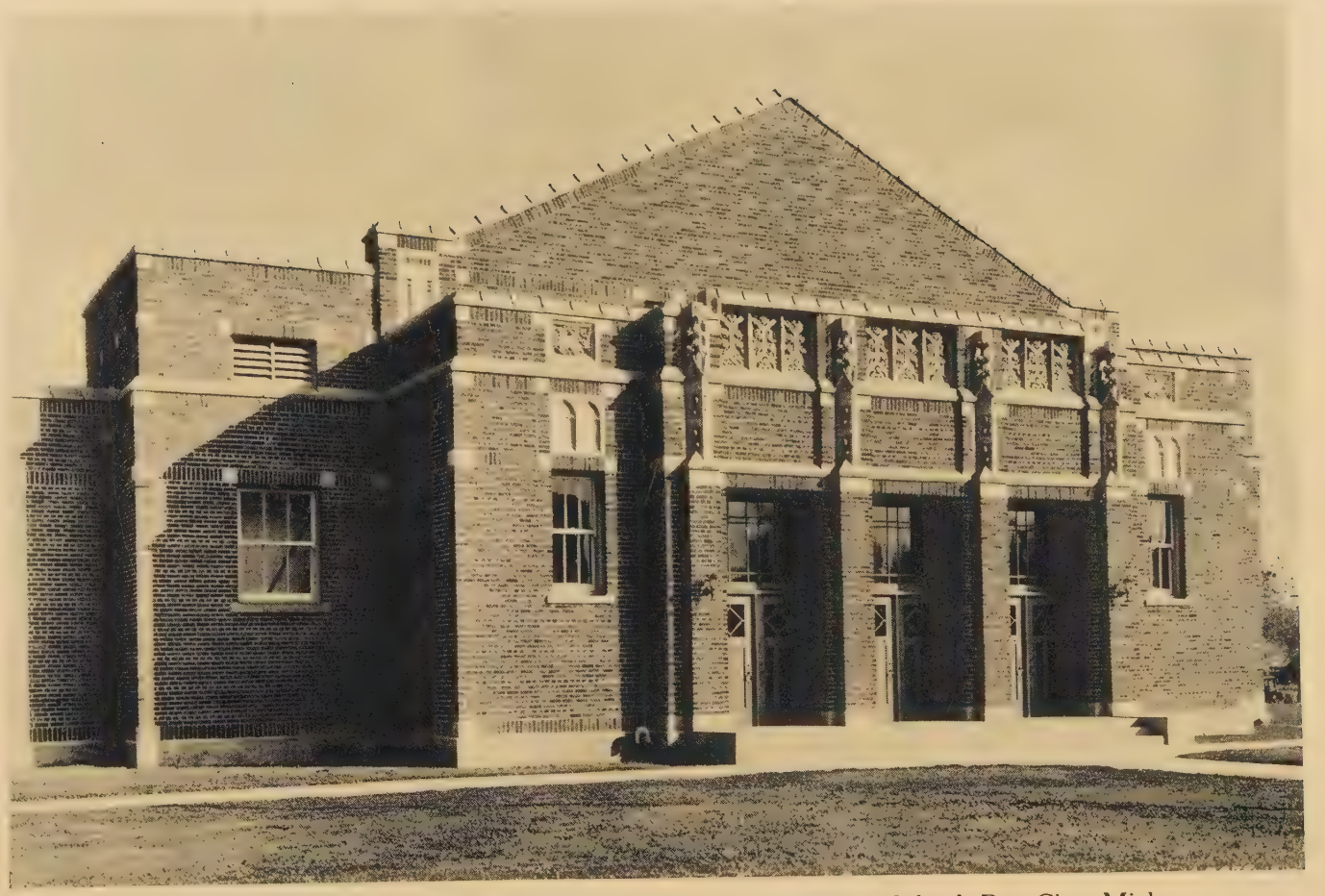
The portions now built of the Julia E. Test Junior High School at Richmond were constructed in 1923 at a cost of $277,373.00. The buildings contain 853,787 cubic feet, showing a unit cost price of 32.5 cents per cubic foot or $555.00 per pupil.

Detail of West Front
Julia E. Test Junior High School, Richmond, Ind.

The Thomas L. Handy Junior High School, Bay City, Mich., is one of the two junior high schools serving that community. It is a large semi-detached group of buildings in Gothic style, and consists of Academic Section, with provision for future extension; the Gymnasium wing, containing also a Natatorium and the Auditorium wing adjoining it, Manual Training Shops and Lunch Room. The building is situated on a large site on the west side of Bay City. For illustration of interior of Auditorium see page 209. For illustration of Gymnasium, see page 192.



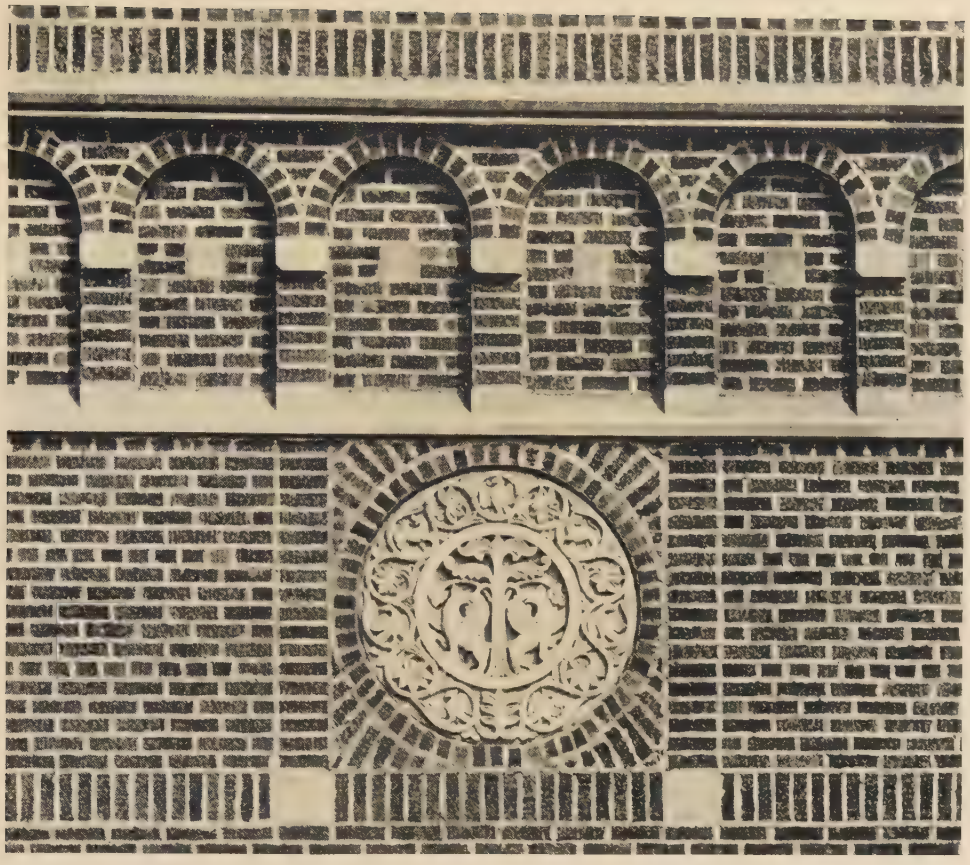
The Thomas L. Handy School at Bay City, Mich., was built in 1922. It represents a total cost of $581,500.00. It contains 2,000,000 cubic feet of space. The cost per foot is 34.1 cents, 850 pupils are accommodated at a unit cost of $802.00 per pupil.



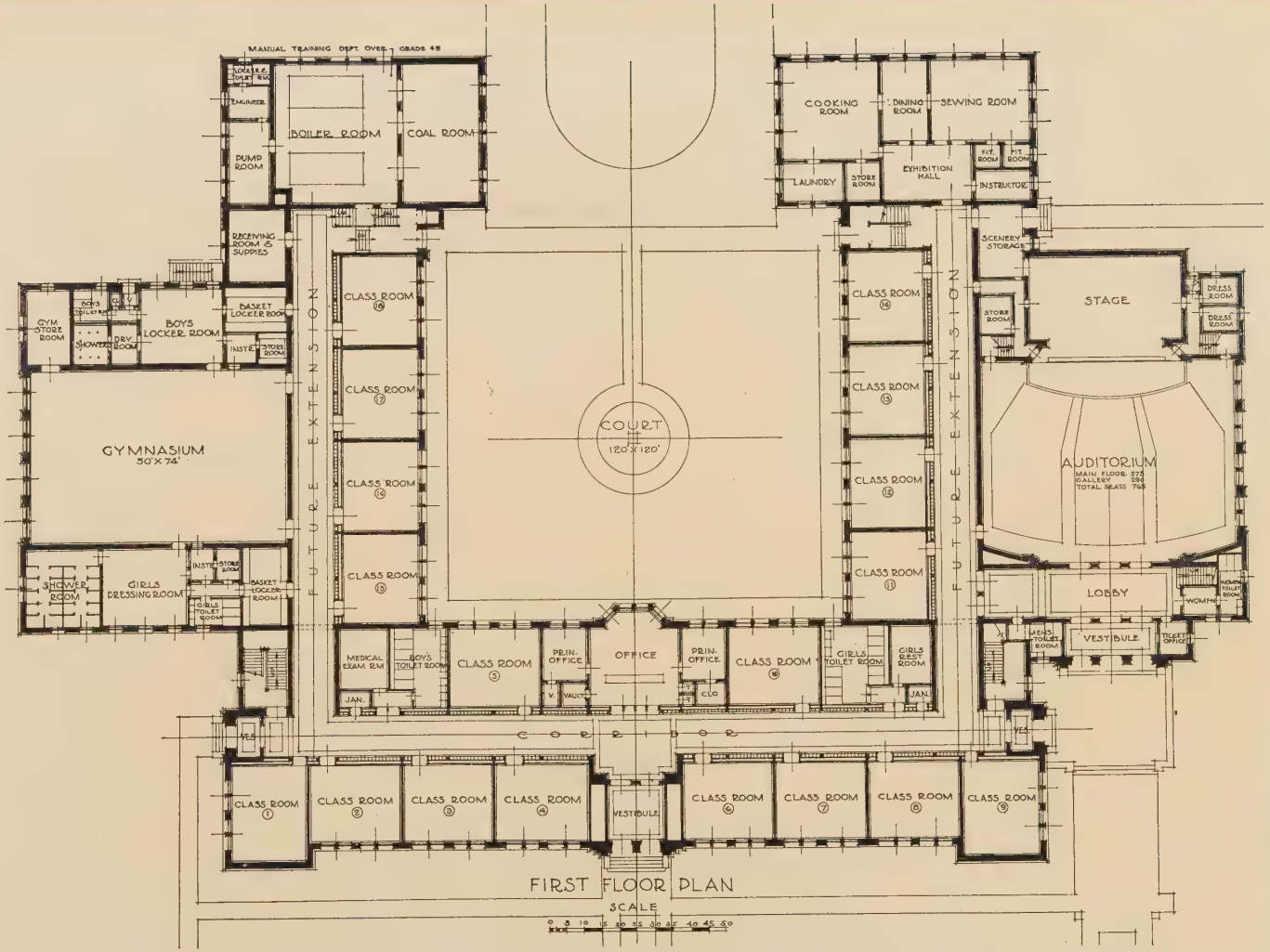
Detail of Auditorium Entrance, Thomas L. Handy Junior High School, Bay City, Mich.

Main Entrance to Academic Section, Thomas L. Handy Junior High School, Bay City, Mich.

The Roosevelt Junior High School, at Appleton, Wis., is one of two similar buildings built in 1924, each providing facilities for half of the school population of seventh, eighth and ninth grades in this paper mill city. Its companion building is the Woodrow Wilson Junior High School.



The above is a detail of one of the end pavilions at the Roosevelt Junior High School at Appleton, Wis. This is a good example of the decorative possibilities of an inexpensive design well executed in brick and stone—the color, texture and craftsmanship playing an important part.



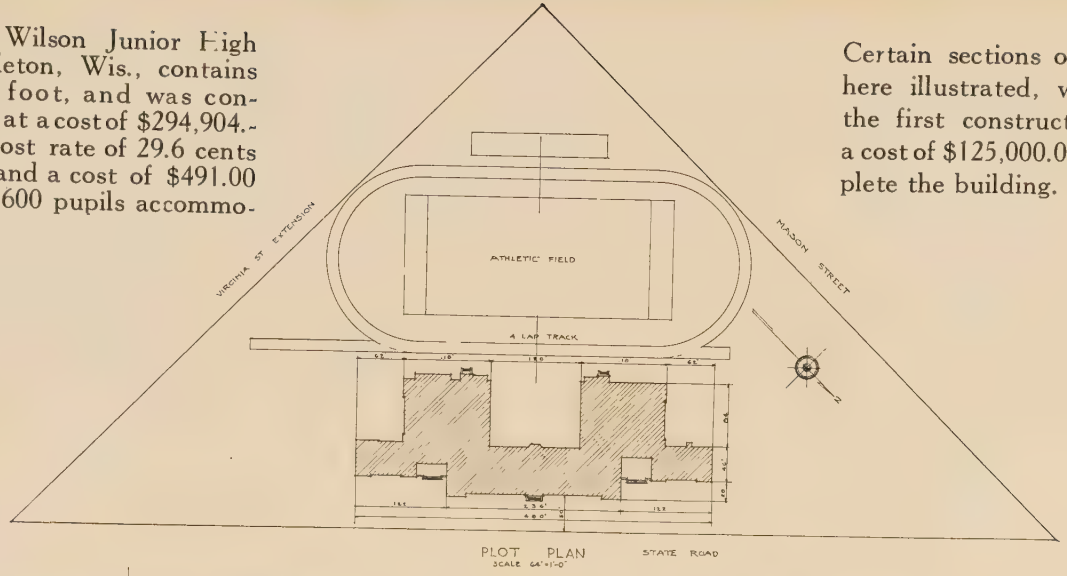
The Roosevelt Junior High School at Appleton, Wis., accommodates 600 pupils, contains 902,851 cubic feet and cost $288,102.00, which shows a cost per cubic foot of 31.9, and a cost per pupil of $480.00. Certain sections of this building, as here illustrated, were omitted from the first construction and represent a cost of $125,000.00 necessary to complete the building.

The Entrance Tower of the Roosevelt Junior High School is its principal architectural feature. It is in the English Gothic style and the upper part serves as a fresh air intake for the ventilating system.

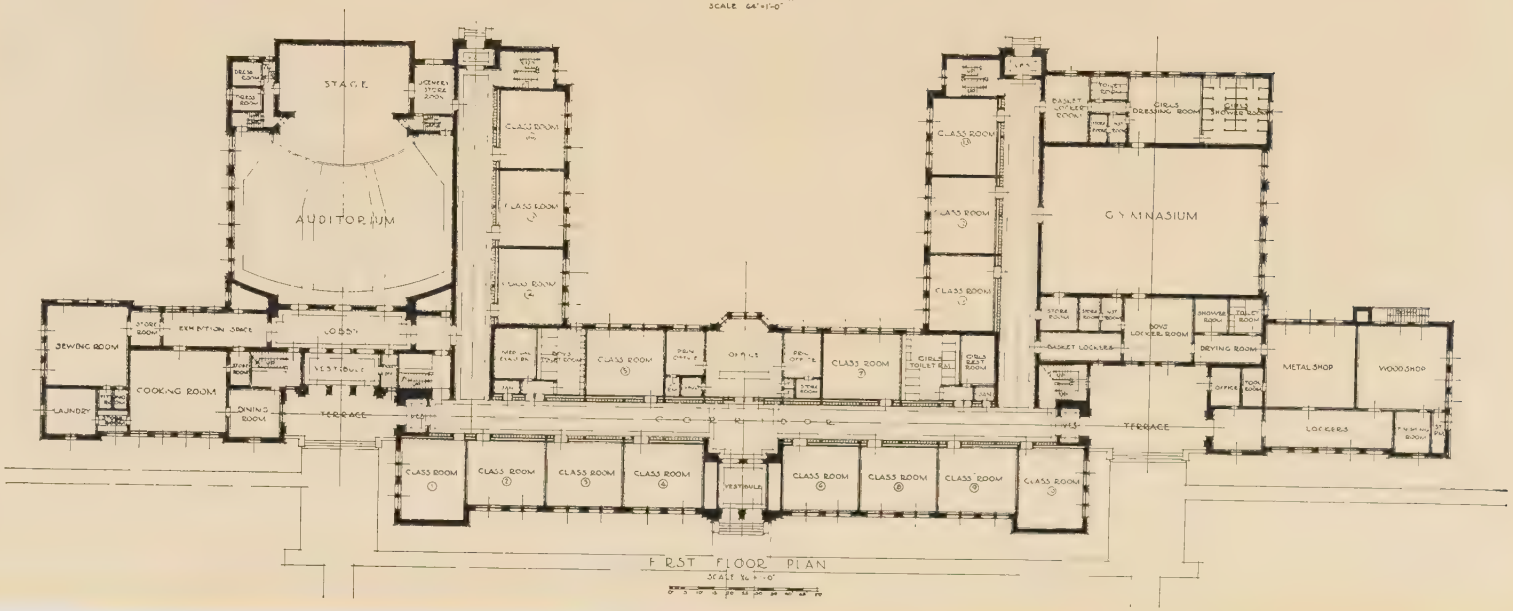
The Woodrow Wilson Junior High School at Appleton, Wis., is designed in the Lombard Gothic style and is a companion to the Roosevelt School. The two buildings are substantially the same in size and provide the same accommodations. Their sites are quite different and their architectural expression individual.

The Woodrow Wilson Junior High School at Appleton, Wis., contains 995,635 cubic foot, and was constructed in 1924 at a cost of $294,904.-00, showing a cost rate of 29.6 cents per cubic foot and a cost of $491.00 for each of the 600 pupils accommodated.

Certain sections of this building, as here illustrated, were omitted from the first construction and represent a cost of $125,000.00 necessary to complete the building.



PLOT PLAN
SCALE 64'=1'-0"



FIRST FLOOR PLAN
SCALE 32'=1'-0"

The Entrance Tower of the Woodrow Wilson Junior High School at Appleton, Wis., is a simple and dignified architectural feature, all of which is fully utilized, the upper part being the fresh air intake for the ventilating system. This building is built of brown matt face brick of variegated color laid with rough cut mortar joints of light buff. The roof is of green glazed tile.

SECTION III

Senior High Schools

Illustrating

Whiting, Ind., High School
St. Joseph, Mich., High School
New Trier Township High School, Kenilworth, Ill.
Pontiac, Mich., High School
Hinsdale, Ill., High School
Danville, Ky., High School
Bay City, Mich., High School
St. Clair, Mich., High School
Lincoln High School, Manitowoc, Wis.
Mishawaka, Ind., High School
Evanston, Ill., Township High School

Designed by
PERKINS, FELLOWS AND HAMILTON
Architects, Chicago

Mobile, Ala., High School

PERKINS, FELLOWS AND HAMILTON
GEORGE B. ROGERS, MOBILE
Associate Architects

Senior High Schools

THESE institutions are designed to accommodate the three or four grades up to the twelfth, depending upon whether the junior high school system, or the eight-grade elementary school system is in use in the district served.

The public has come to both demand and provide large sites for high schools. Fifteen acres is now regarded as a minimum size for the site of a large high school and many high schools have much larger areas, even up to fifty-five acres, as in the case of the Evanston Township High School. The public has also come to regard the quality of site and the advantages which may be provided on a good piece of ground as more important than absolute centrality of location.

The Manitowoc High School site is at the extreme southeast corner of the city; the Bay City and Mishawaka High School sites are at the eastern limits and the Evanston High School is at the center of the western portion of the city. In many such cases motor busses are especially provided for transporting the more distant pupils and thus increase the accessibility of sites distant from the geographic centers.

Much public attention was given to the selection of these locations and their various qualities were well considered by the voters. As arranged,

they all provide not only for future additions to the building but large areas for athletic purposes and for ornamental parking, all of which is now regarded as essential.

The high schools herein illustrated show the progress of seventeen years and the development of types of plan expressing the chief characteristics of high schools of the present day.

The St. Joseph and Danville high schools are of small size and have their auditoriums and gymnasiums in the center of the building with the rooms for academic subjects on either side. The Whiting and Pontiac schools were limited by local conditions of site to the compact arrangements shown. The group plan of New Trier High School was influenced by the existence of the center building but ample ground was purchased which made the development of an institutional plan possible. In the high schools at Bay City, Manitowoc, Mishawaka and Evanston, and the one now being finished in Mobile, the connected group plan was developed and followed in each case. The advantages of separate construction and of separate use of the principal units was provided for in all of these schools.

The auditoriums and the gymnasiums were provided at the outset except in Evanston, in which case the south wing, containing the auditorium and lunch room, is deferred until further funds are available, an example of the flexibility of this type of plan.

In all of these latter schools the academic departments of the high school are concentrated; class rooms, laboratories, special rooms and study halls are central, easy of access and the confusion of passing between classes is minimized, giving a second element of advantage. The auditorium at one end of the group and the gymnasium at the other, are generally used for longer periods and can be conveniently used for purposes outside of school work when not demanded by the school program. This gives a third element in the convertability of this plan.

The fourth element is the elimination of noise and odor from the lunch room which is always present in buildings where basement or attic spaces in the main structures are used for this purpose.

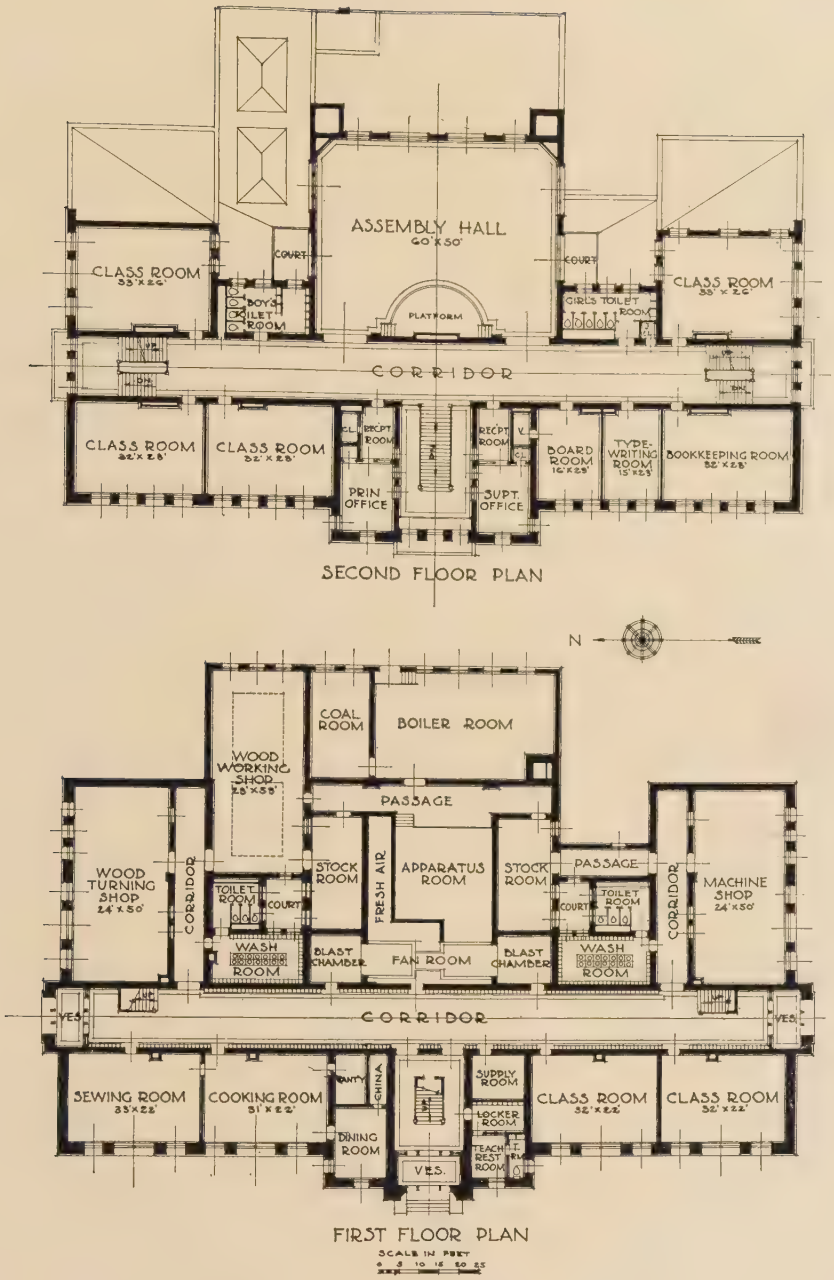
Future additions are provided for all of these institutions and are shown on the plans. It is the academic portions that are most apt to require enlargement during the years that follow the initial construction. Auditoriums and gymnasiums once built are not subject to the same requirements for expansion.

Construction in all cases is now fireproof and is usually prescribed by state or municipal regulations to provide for the safety and health of pupils. Not only are the buildings fireproof but they are limited in height and must conform to minimum requirements for capacities of exits and stairways and properly lighted corridors.

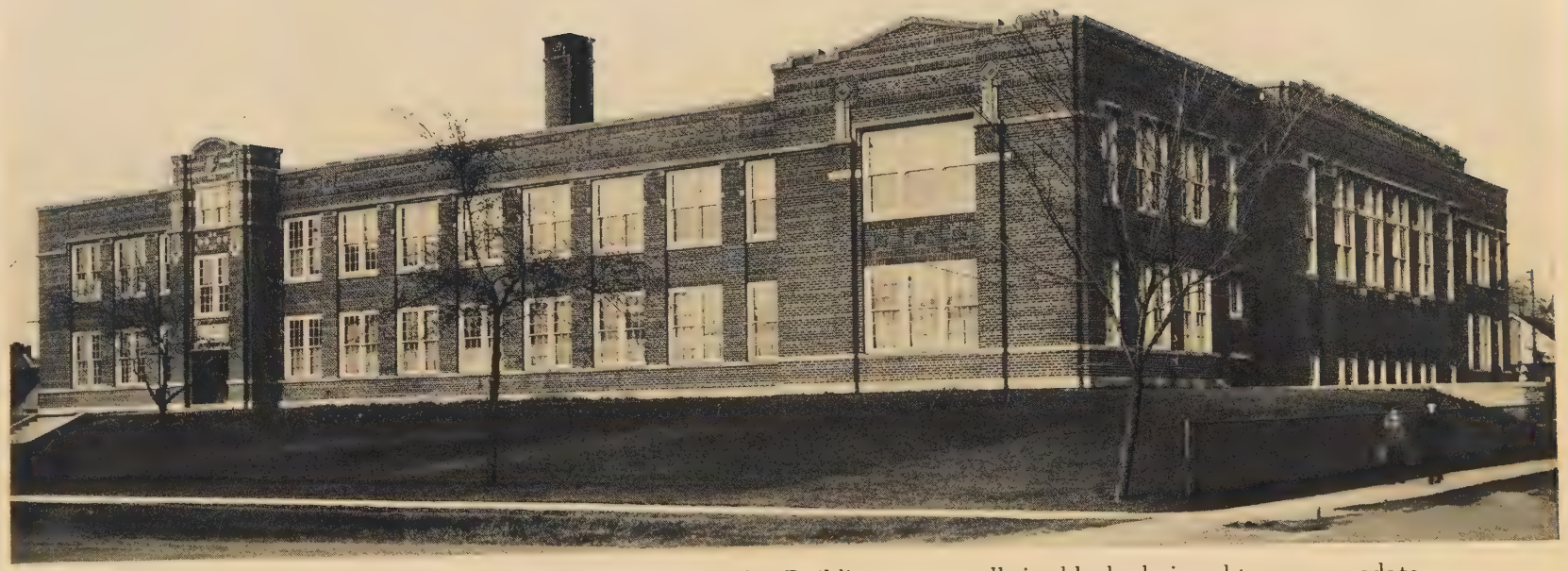
Reference to the explanatory notes under the illustrations gives the pupil capacity of the various plans. This is figured without reference to the assembly hall and follows a theory, more or less applicable in all of these schools, to the effect that class rooms, science laboratories and study halls accommodate between 70 and 75 per cent of the total capacity, the rest being provided for in commercial rooms, music, manual training, domestic science, mechanical and free hand drawing rooms and gymnasiums.

The proportion of class rooms to other facilities is carefully determined so that with attendance at normal capacity, all portions of the school will be efficiently used and so that no study or occupation will be neglected for want of space.

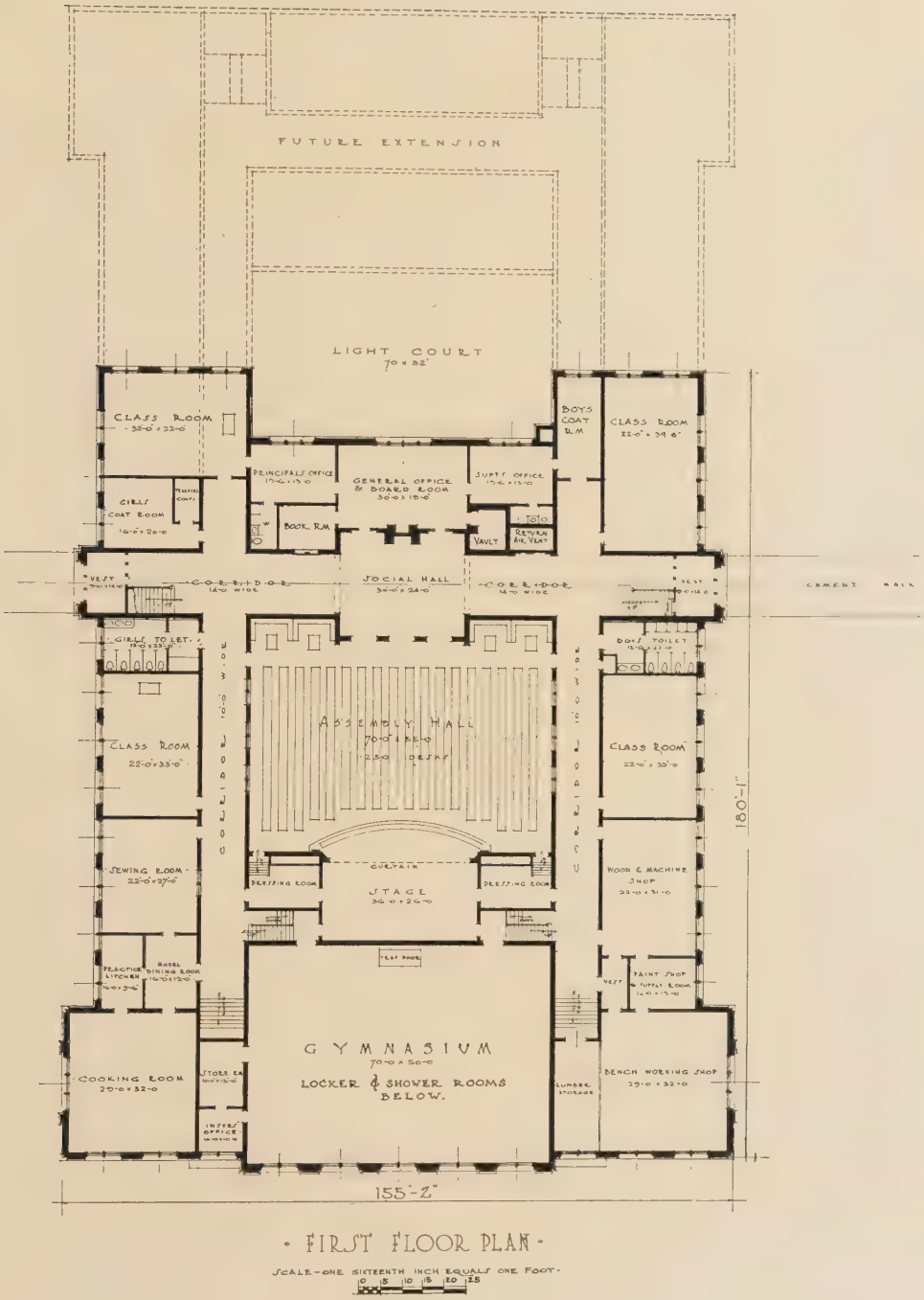
The Whiting, Ind., High School. Whiting is a city just one mile square in which the large refineries of the Standard Oil Company are situated. Its entire school plant, including the public library, is on one site, of which the high school occupies a part.



The Whiting, Ind., High School was built in 1908, is of semi-fireproof construction and cost $110,000.00, or a cost rate of about 14 cents per cubic foot. The pupil capacity for which the building was designed was 300.



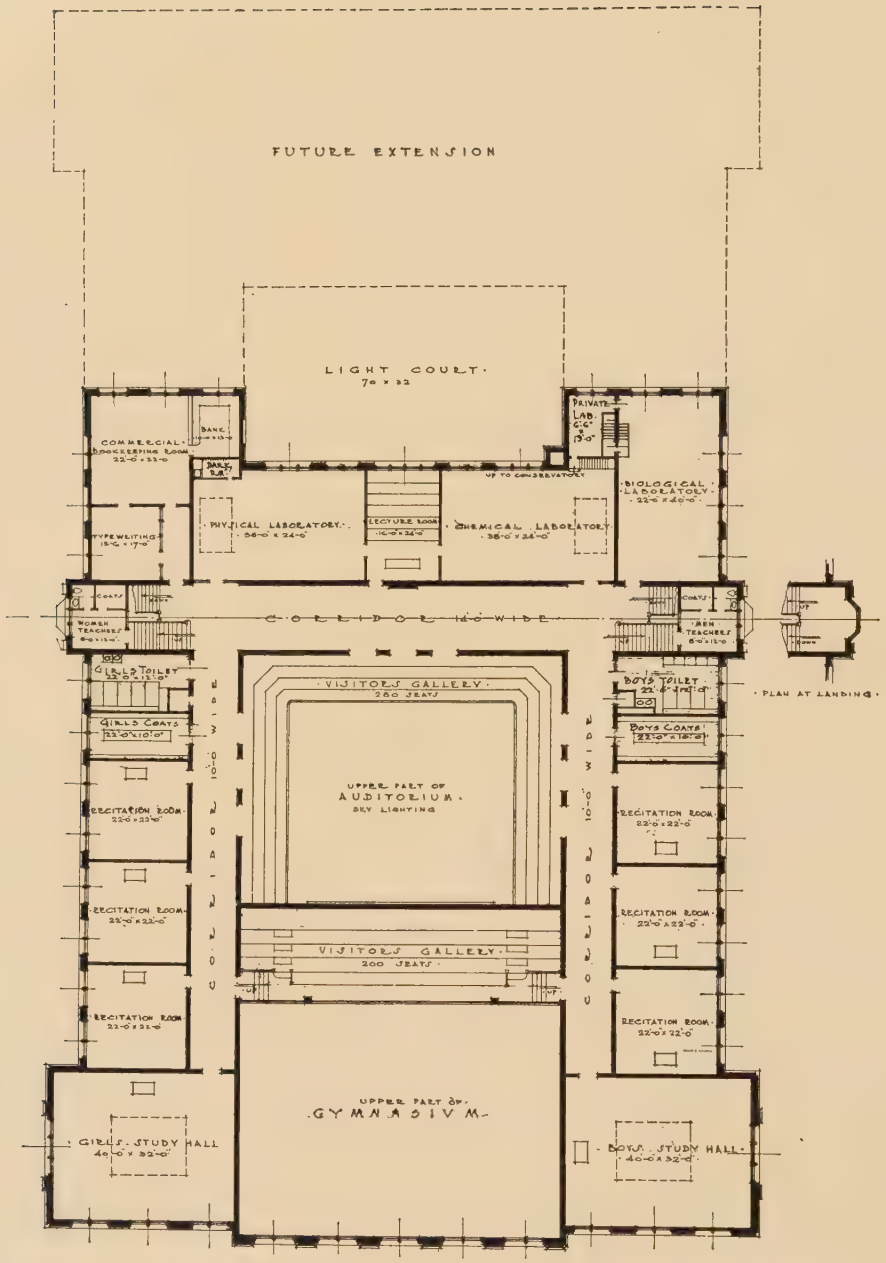
The High School at St. Joseph, Mich., is a simple Gothic Building, on a small city block, designed to accommodate 500 pupils, with provisions for future extensions. It has proved to be a very unusual type of building for a small high school and its cost was exceedingly low. It is of semi-fireproof construction. For illustration of Auditorium see page 219. For interior of Gymnasium see page 186.



• FIRST FLOOR PLAN •

SCALE - ONE SIXTEENTH INCH EQUALS ONE FOOT.

The St. Joseph, Mich., High School was constructed in 1915 and 1916 at a cost of $103,433.37. The cubic contents are 865,170, showing a cost per cubic foot of 13.1 cents. It has a pupil accommodation of 500, showing a building cost per pupil of $207.00.

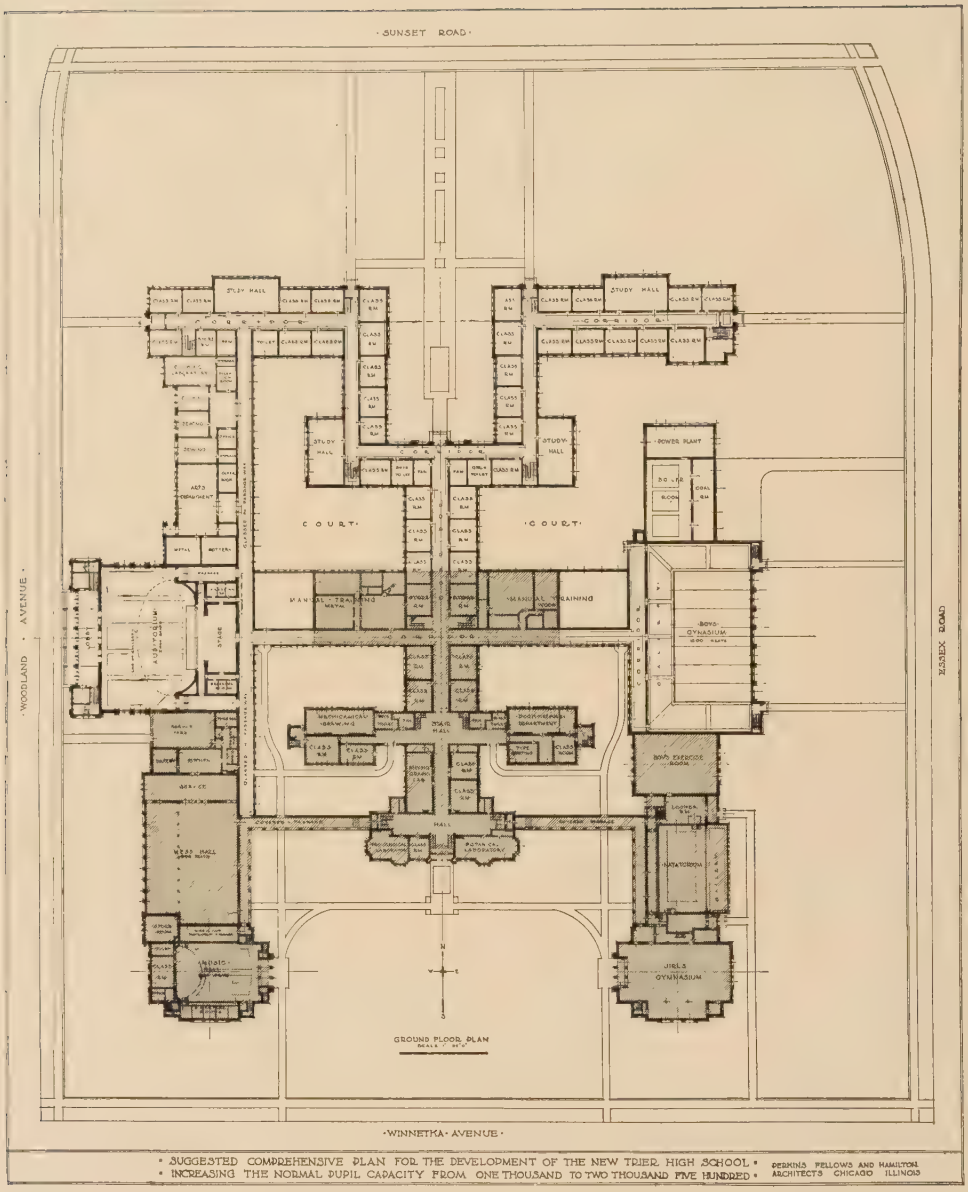


• SECOND FLOOR PLAN •

• SCALE - ONE SIXTEENTH INCH EQUALS ONE FOOT •

ST. JOSEPH, MICH., HIGH SCHOOL

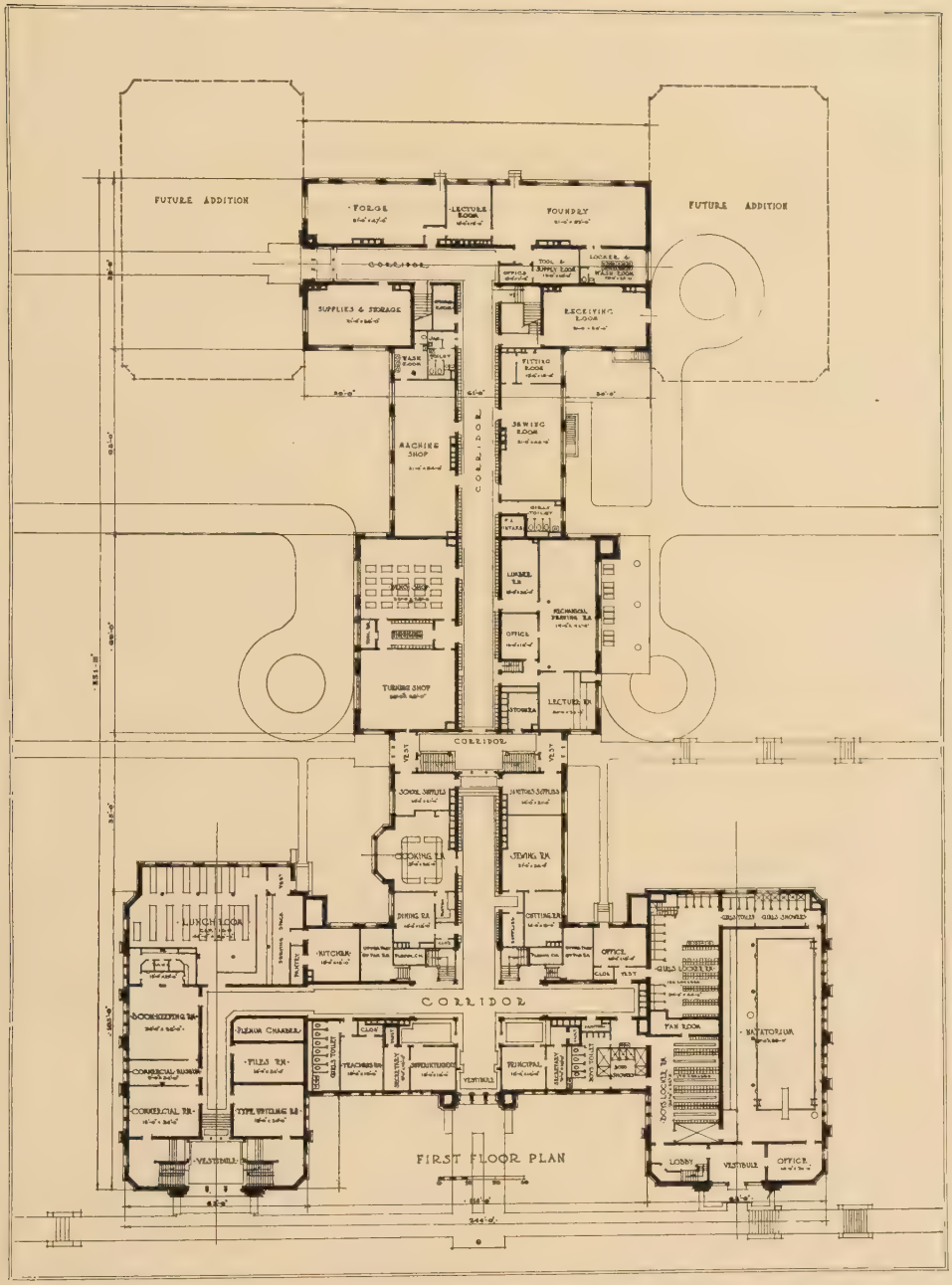
The Gymnasium wing of the New Trier High School, above illustrated, is connected with the Academic Section by a roofed passage enclosed on one side and open on the other. This wing contains Gymnasiums for both boys and girls, and a Natatorium.



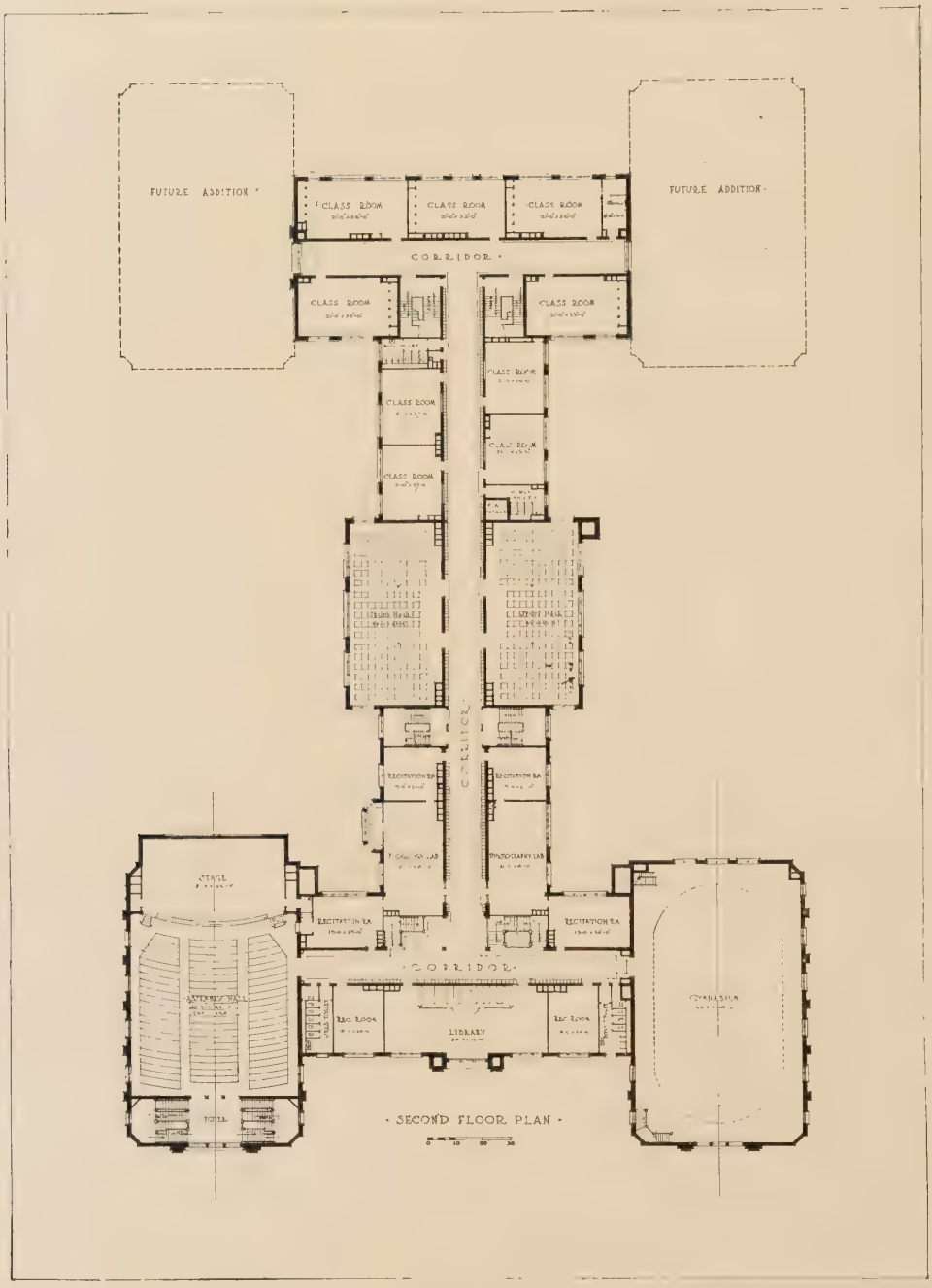
The plan shown above of the New Trier Township High School, Kenilworth, Ill., illustrates the buildings now in existence in darker shade and a suggestive plan of expansion by adding to the present group. The small original central building of the present group was not designed by the Authors. The Board of Education has shown great foresight and wisdom in acquiring a sufficient amount of land, including a block adjoining the one above shown, to fully provide for all future development. For plan and illustration of new Mess Hall, see pages 230 and 231. For interior of Auditorium see page 217. For interior of Gymnasium see page 191. For Natatorium see page 201.

The color and texture of the massive vine-covered brick walls of the wings of the New Trier High School are well illustrated at the Entrance to the Auditorium.

The High School, at Pontiac, Mich., is greatly enhanced by its east frontage on a beautiful park. The site is narrow and deep. A large addition has been built since the original building was constructed in 1913 and other additions will be necessary for the future.

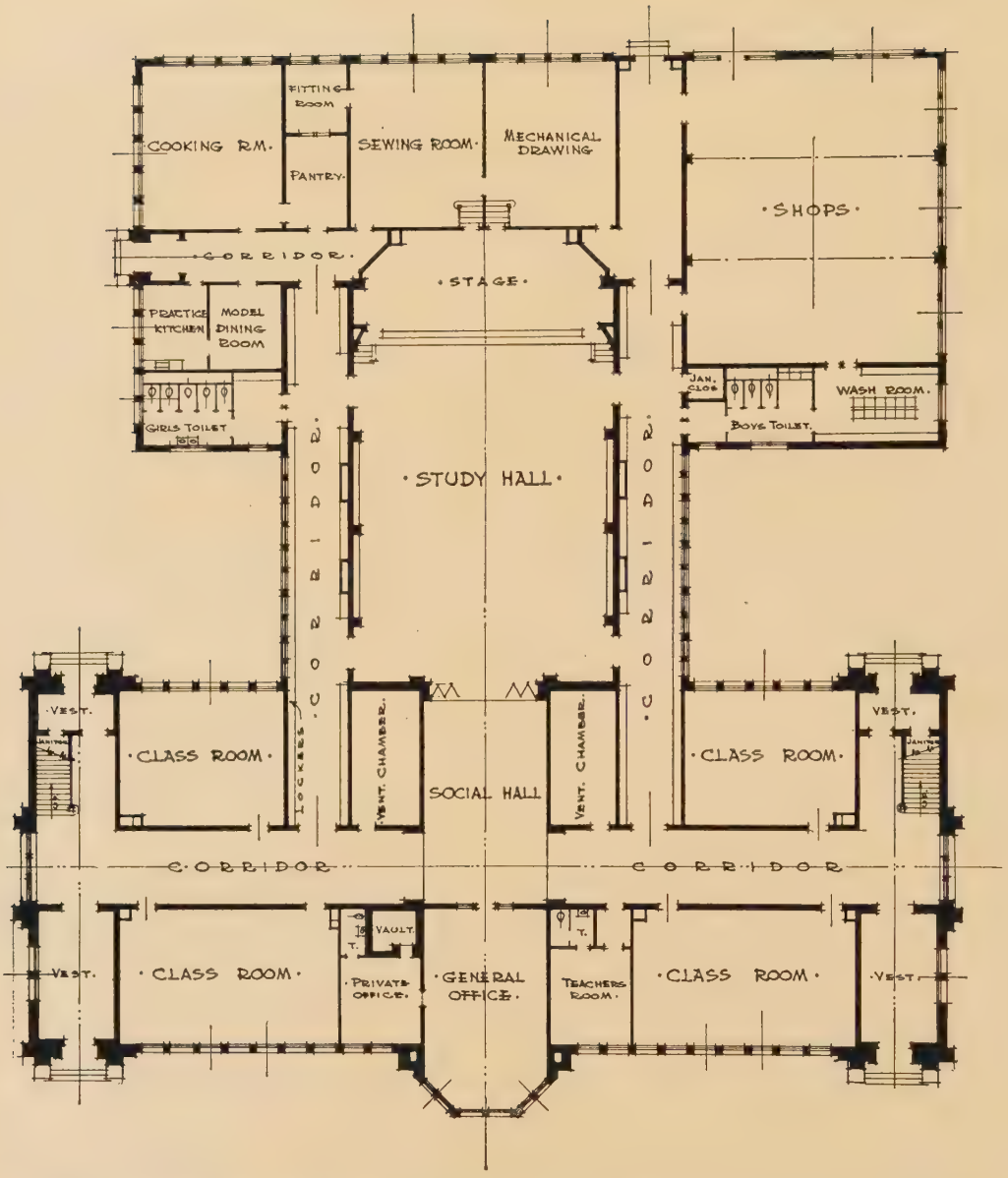


The first section of the Pontiac High School, ending with the west wall of the study halls at the point where the chimney stack is shown, was built in 1913 and is of fireproof construction. The building contains 1,509,960 cubic feet and was constructed at a cost of $217,402.70 or 14.4 cents per cubic foot. It had a pupil capacity of 675, showing a cost per pupil of $322.00. The Addition to this building was built in 1917, at a cost of $121,000.00. It contains 610,228 cubic feet and cost 19.8 cents per cubic foot. The cost per pupil of the first and second sections combined was $283.00.



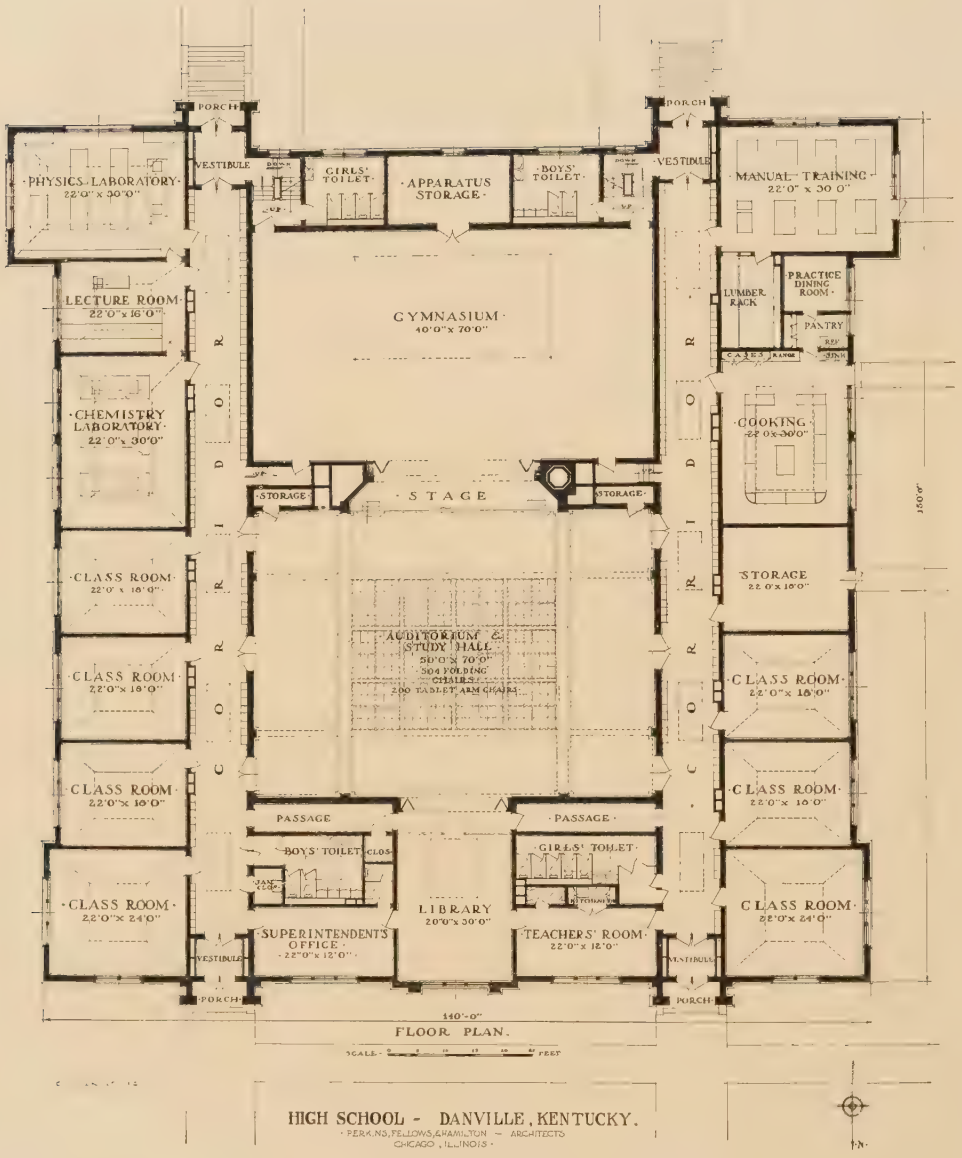
The Pontiac High School, Pontiac, Mich.

The Academic Section of the Hinsdale, Ill., High School contains a large room combining study hall, library and assembly hall functions. Manual training, domestic science departments, class rooms, laboratories and general office, separate gymnasiums and auditorium buildings are to form wings about this central section.



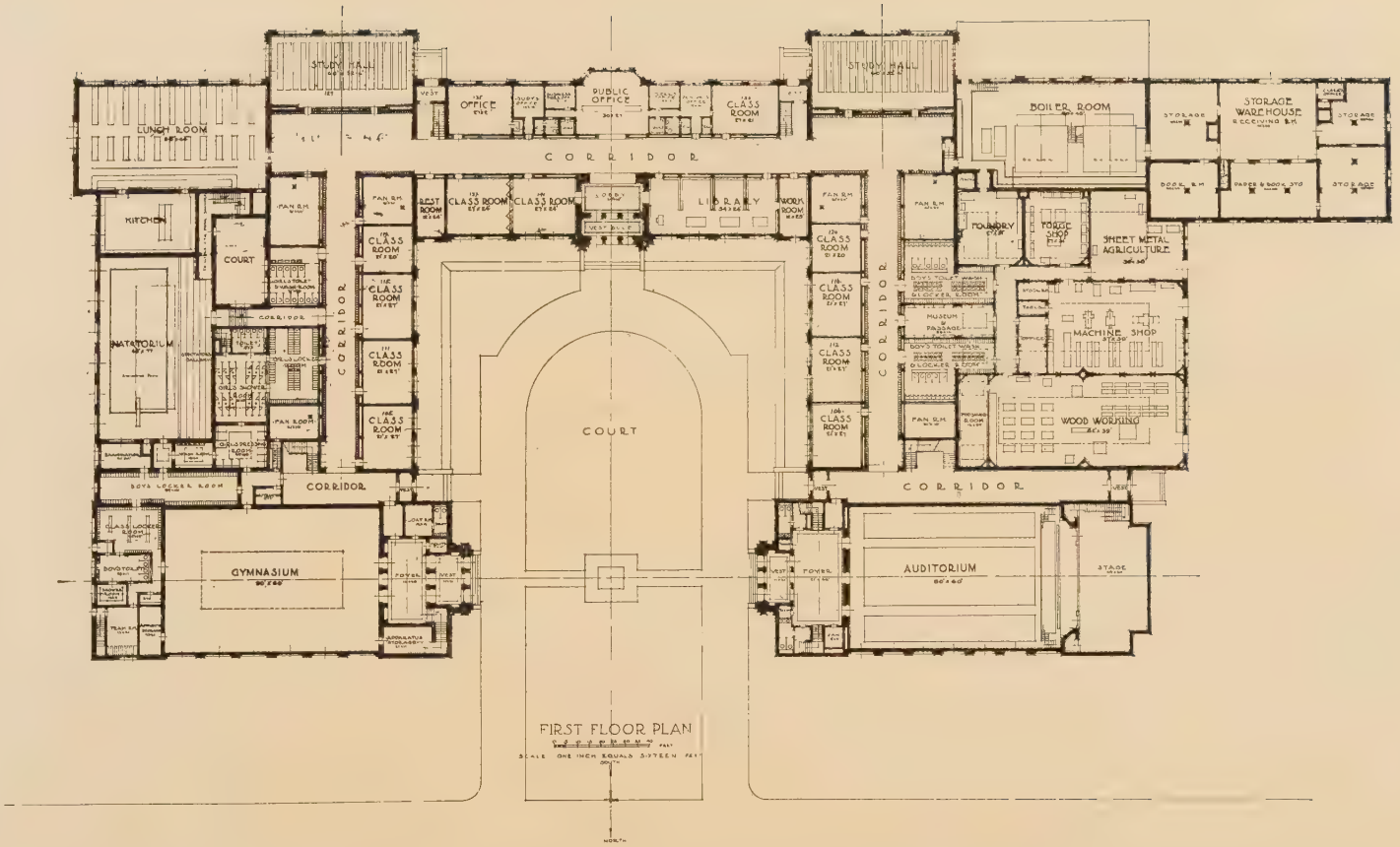
The Academic Section of the Hinsdale High School was constructed in 1916, at a cost of $90,866.38. It contains 500,000 cubic feet and accommodates 400 pupils. Its cost per cubic foot was 18 cents and its cost per pupil $227.00.

The Danville, Ky., High School is an example of the one story type of building adapted to the purposes of a small high school. The utmost service is afforded for a very small expenditure.

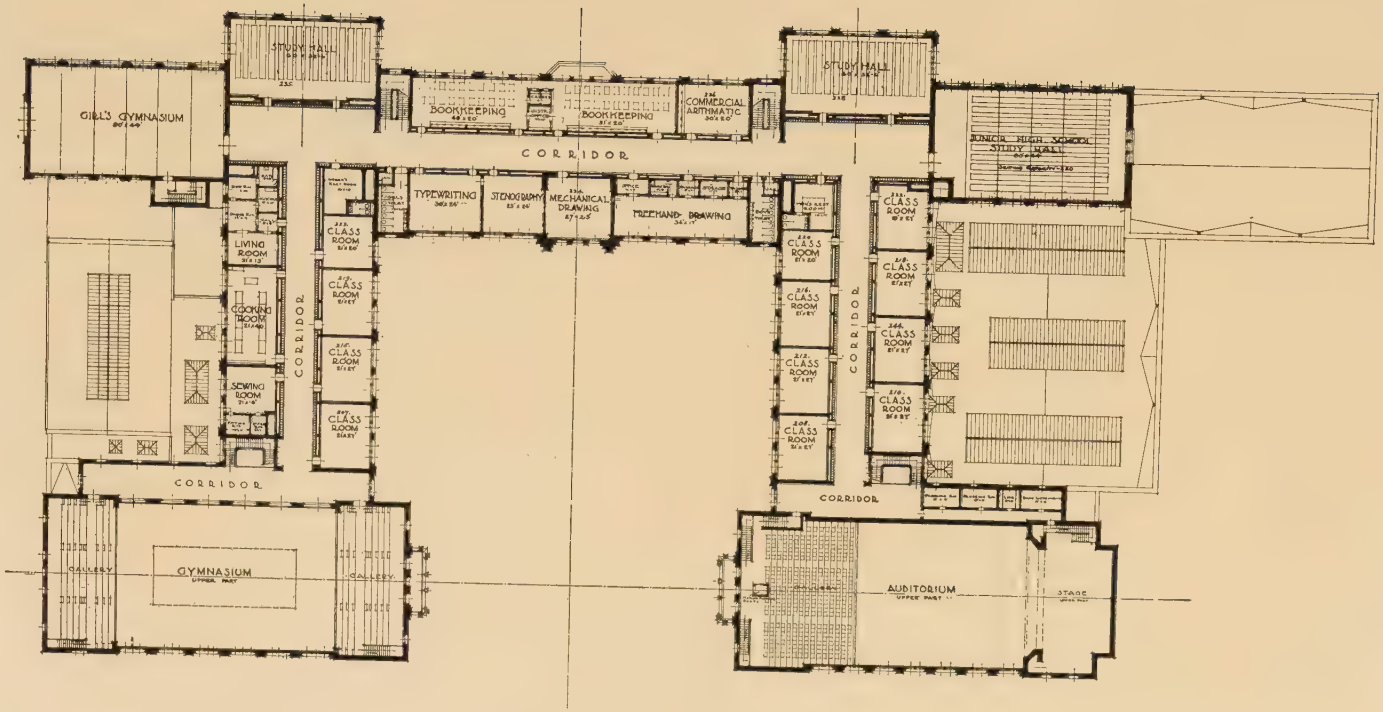


The Danville, Ky., High School was constructed in 1917. It contains 370,720 cubic feet and was completed at a cost of $53,731.00. It accommodates 300 pupils, cost 13.9 cents per cubic foot and $300.00 per pupil. The bath and locker rooms for physical culture work are located beneath the science laboratories, taking advantage of a drop in the grade of the grounds.

The Bay City, Mich., Senior High School, after a long period of delay in preliminary action to authorize its construction, was finally begun in 1920 and completed in 1922. It represents an advanced type of connected group plan with provisions for further extensions to the various sections.



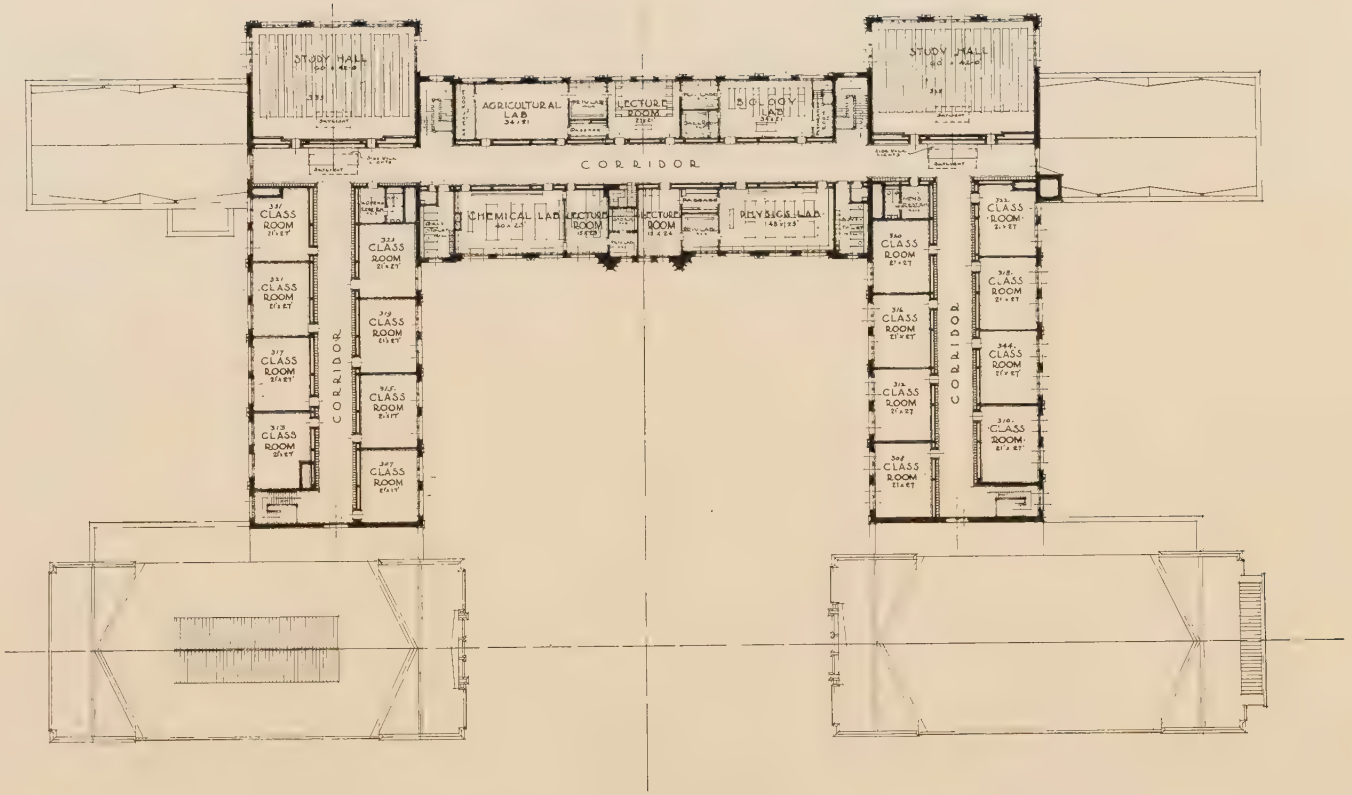
The Bay City High School plan was designed to present its most important frontage on the main street to the north, but all its frontages are of importance and present attractive architectural compositions. The Girls' Gymnasium and Lunch Room are yet to be built. For interior illustration of Auditorium see page 208. For interior illustration of Gymnasium see page 193. For interior illustration of Natatorium see page 202. For interior illustration of Manual Training Shops see pages 261, 262 and 263.



·SECOND FLOOR PLAN·

SCALE - ONE INCH EQUALS SIXTEEN FEET.

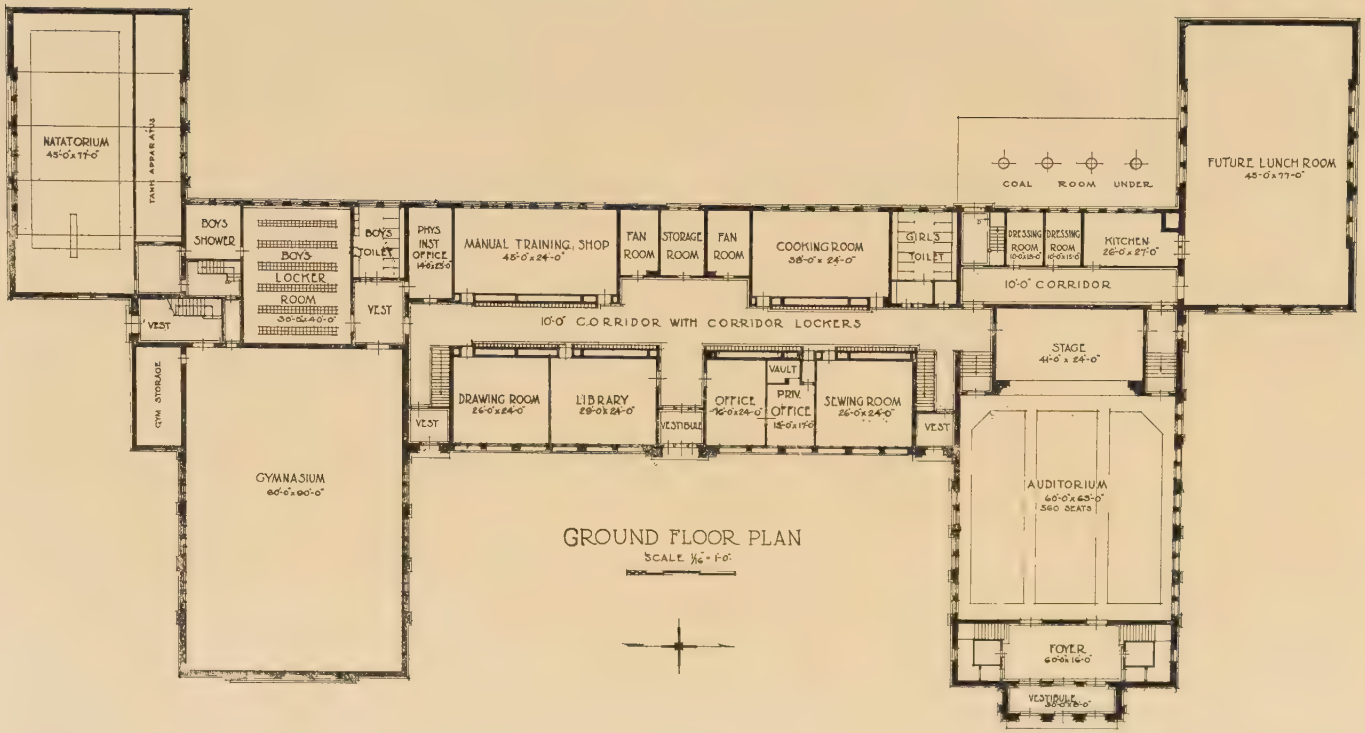
The Bay City Senior High School is entirely of fireproof construction, designed in the Gothic style and is trimmed with a light buff terra cotta. The portion constructed contains 2,957,900 cubic feet and includes in the west wing a large warehouse for supplies and equipment for the Bay City School system. The cost of this building was $1,355,300.00, showing a unit cost of 45.8 cents per cubic foot or $1,129.00 for each of the 1,200 pupils at present accommodated.



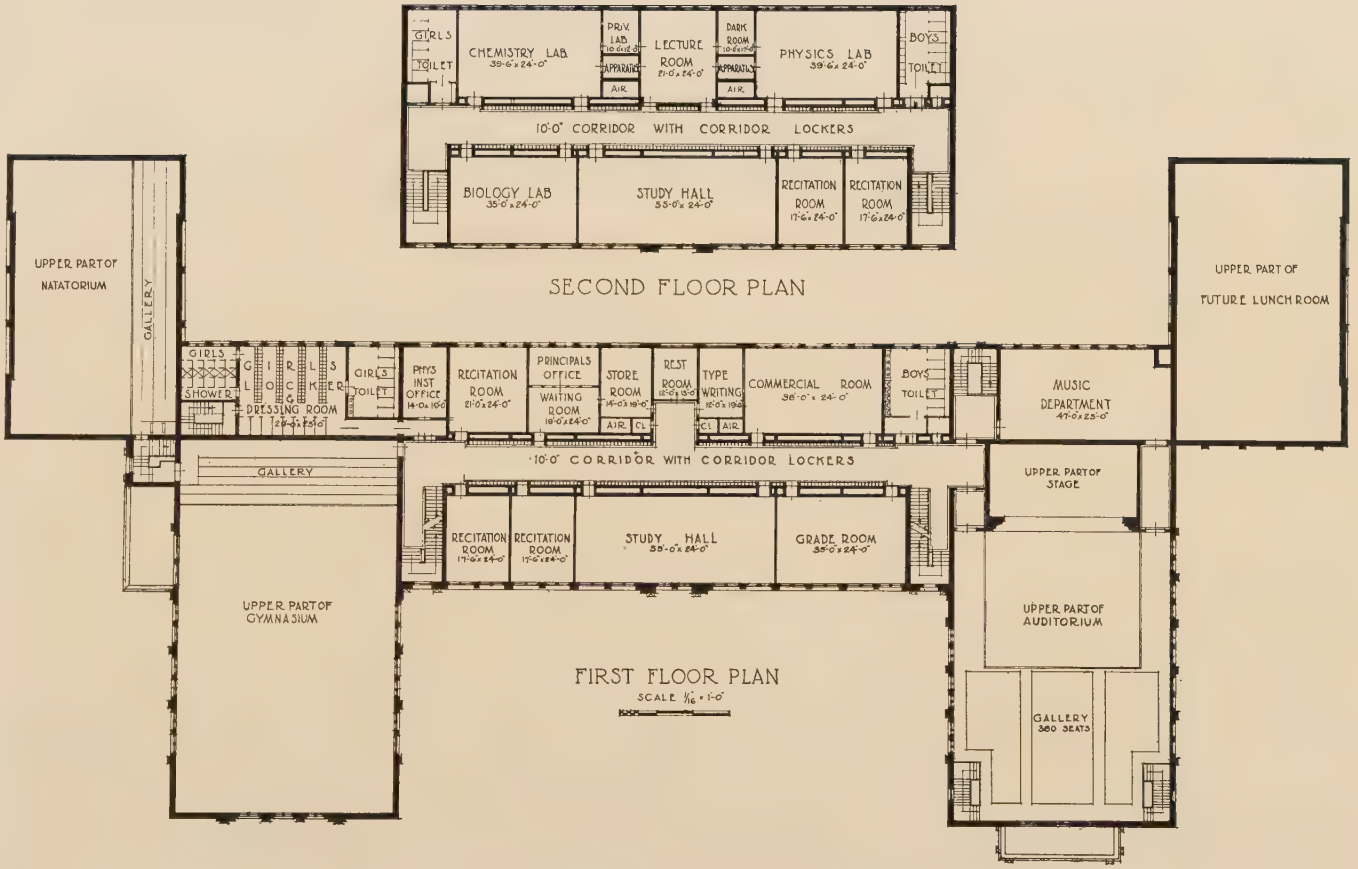
The side wings of the third floor of the Bay City High School above shown, and including the two study halls, are not as yet constructed.

The Terra Cotta Cothic detail is very effectively used in this building and is well illustrated by the above picture of the main entrance at the base of the Bay City High School Tower.

The St. Clair, Mich., High School is a remarkable example of the progressive spirit on the part of a small city of about 4,000 people. The building fronts east and is about half a mile west of the St. Clair River, on which the city is situated. It is a fireproof building of the connected group type with Academic, Auditorium and Gymnasium sections well defined and susceptible of ready enlargement. For interior of Gymnasium see page 197.

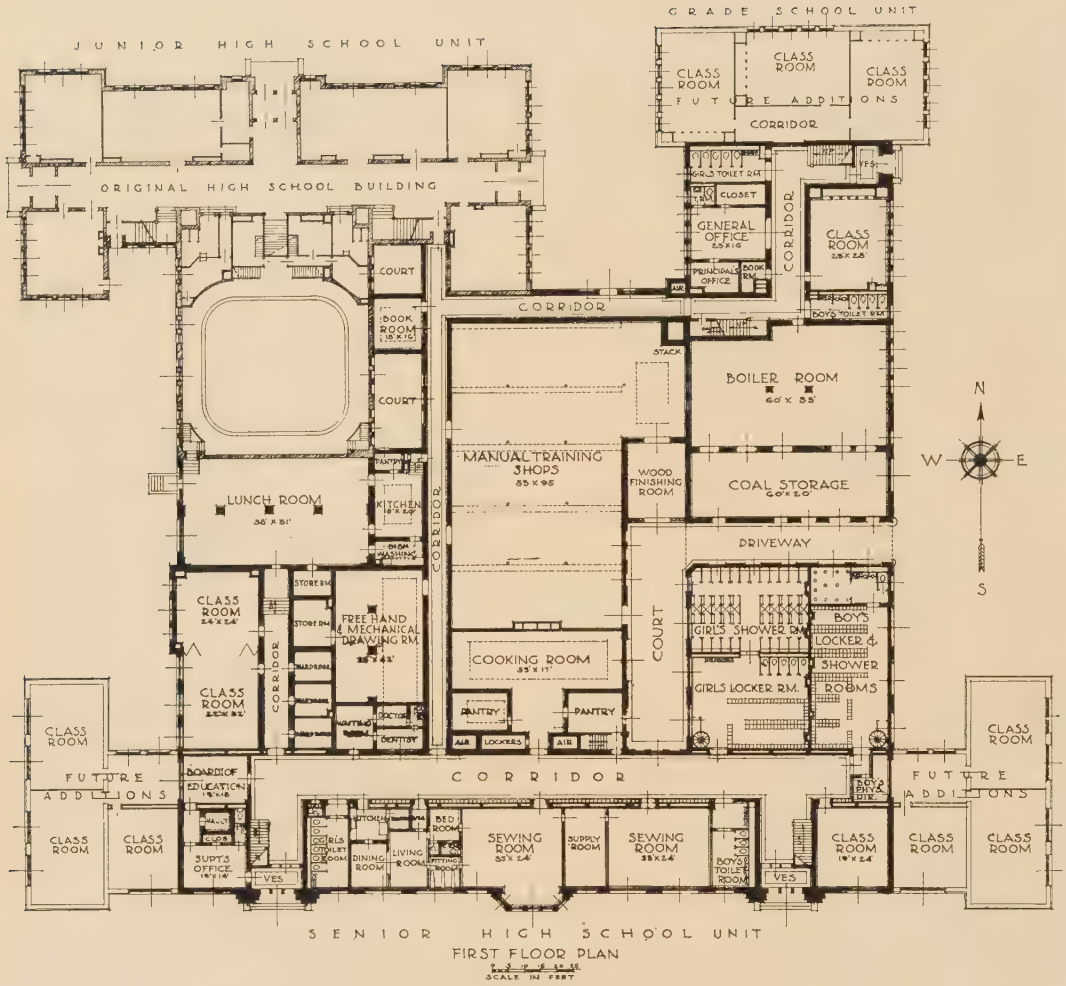


The St. Clair High School was built in 1922 at a cost of $314,327.00. It contains 1,104,454 cubic feet, which shows a rate of cost per cubic foot of 28½ cents. It accommodates 480 pupils, showing a rate of cost per pupil of $655.00.

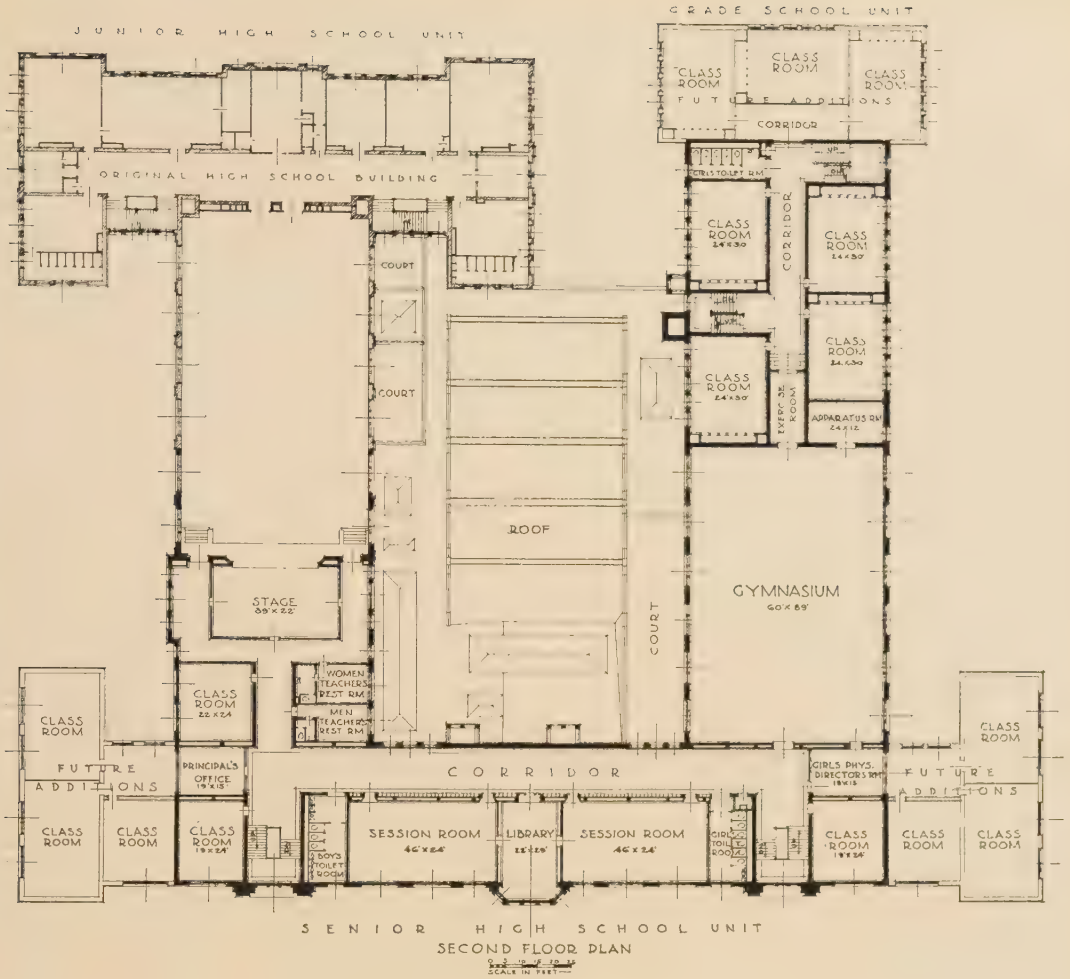


Plans of upper stories, St. Clair, Mich., High School.

The south front of the Senior High School section of the Niles School Group is above illustrated. This Central Group, completed in 1922, together with the old high school embodied in it, houses a complete public educational system from the first to the twelfth grade on a large and attractive site. For illustration of the interior of Gymnasium see page 197.

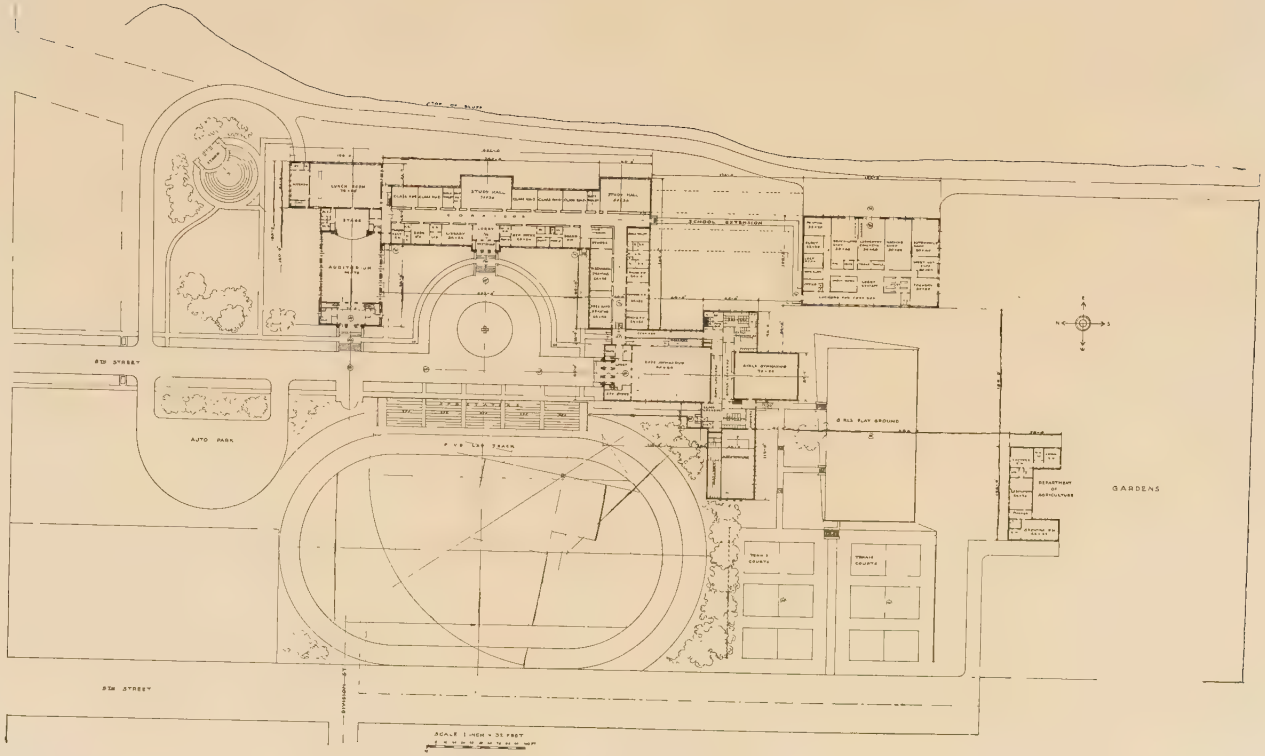


The new grade school section of the Niles Group was built in 1920 in the highest building market since the war. The new high school was constructed at a later period and under much more favorable conditions. The total cost of these additions was $380,000.00, the total cubic contents 1,526,105 cubic feet, showing a cost per cubic foot of 24.8 cents. Provision is made for additions to other sections to both high school and grade school parts.

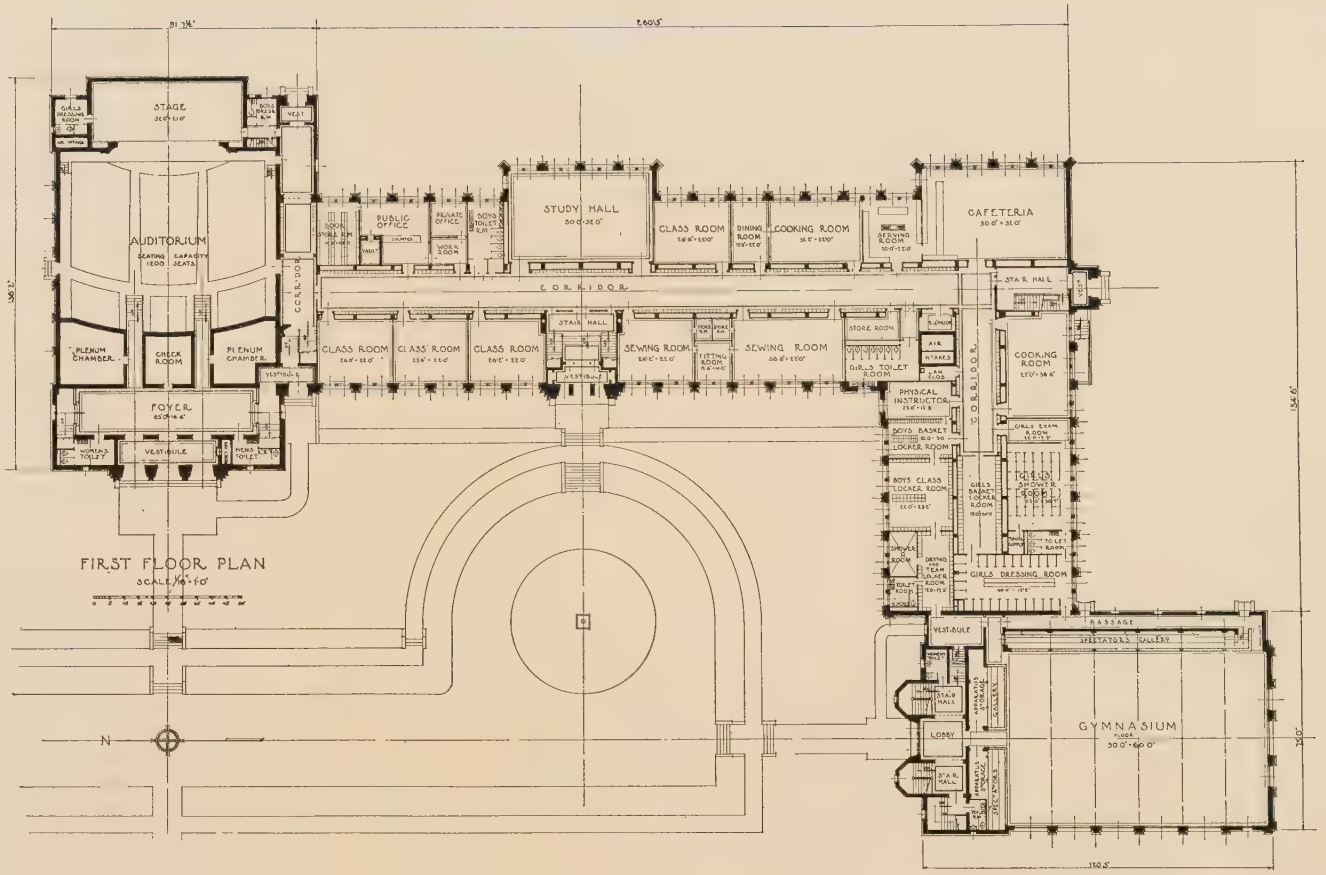


The plan solution of the Niles School Group was doubly difficult for the Architects by the presence of the older high school building and the separate boiler house, both of which had to be preserved and incorporated in the new group.
For illustration of manual training shop see page 270.

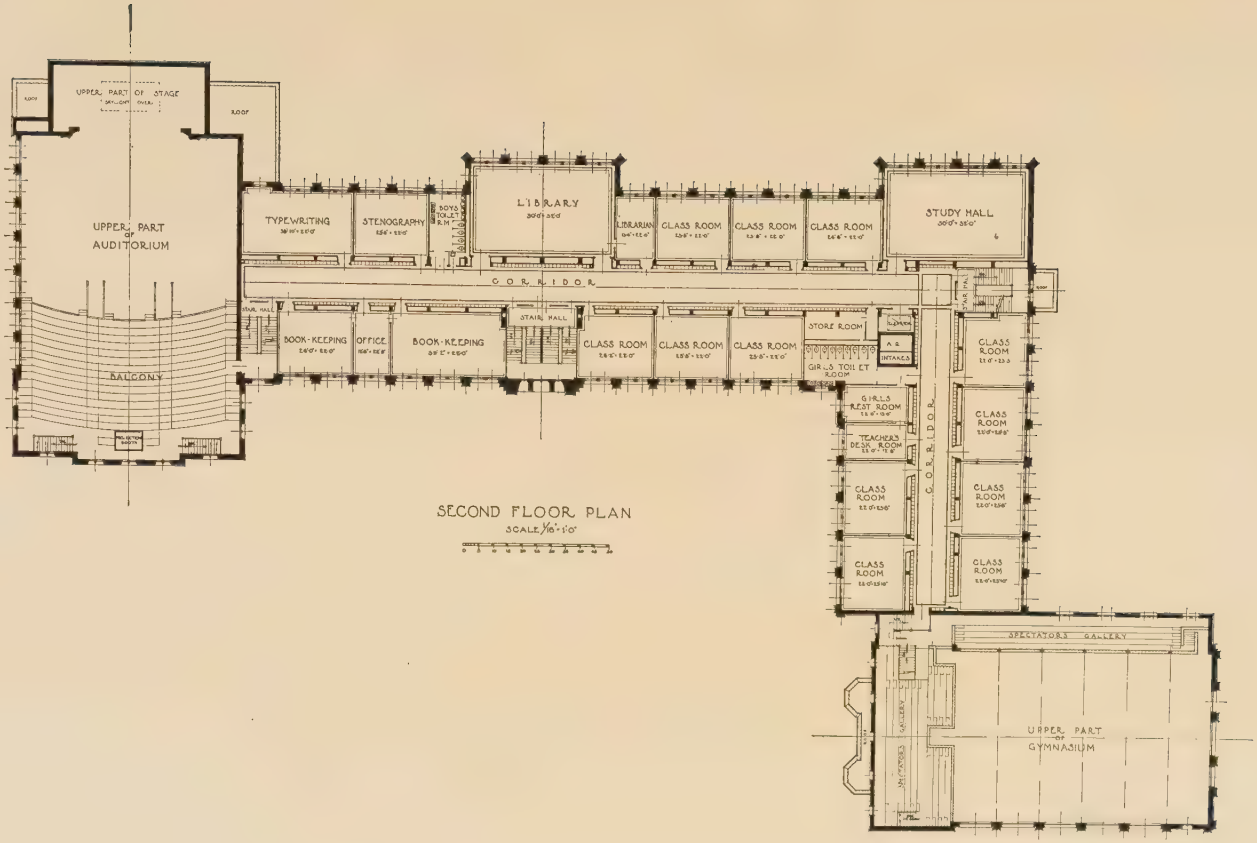
The Manitowoc, Wis., High School problem presented to the Architects an alluring prospect. The site is one of 22 acres at the south end of the main street in the city. It has a fine outlook over both Lake Michigan and the City of Manitowoc. The building is placed at a level of about 70 feet above the lake and the Athletic Field to the west is placed in a natural depression found on the site.



The site of the Manitowoc High School is practically ideal in every respect, affording ample room for all buildings and activities as well as for future expansion, a pleasing and adaptable topography and an almost perfect architectural setting.



The main grouping of the Manitowoc, Wis., High School follows the Authors' well established theory of giving the various high school departments each their individual and characteristic expression on the exterior of the building and arranging the plan in such a manner as to provide the least possible interference to future expansion.



SECOND FLOOR PLAN
SCALE 1/8"=1'-0"

On the second floor level of the Manitowoc High School are the galleries of both Auditorium and Gymnasium. For illustration of interior of the Auditorium see pages 211 and 212. For illustration of the interior of Gymnasium see page 196.

The Manitowoc High School is built of dark red matt face brick of variegated shades, laid with heavy flush joints in white mortar and trimmed with light buff terra cotta of a coarse and rugged texture. The Tower above the roof level is largely a thing of beauty. It was constructed only after careful consideration and upon the demonstration by actual bids received that its cost was just $30,000.00 in excess of an alternative design which would have reduced the group to a very ordinary level from an architectural point of view.

Brick and Terra Cotta Detail, upper portion of Tower, Manitowoc, Wis., High School.

THE LIBRARY

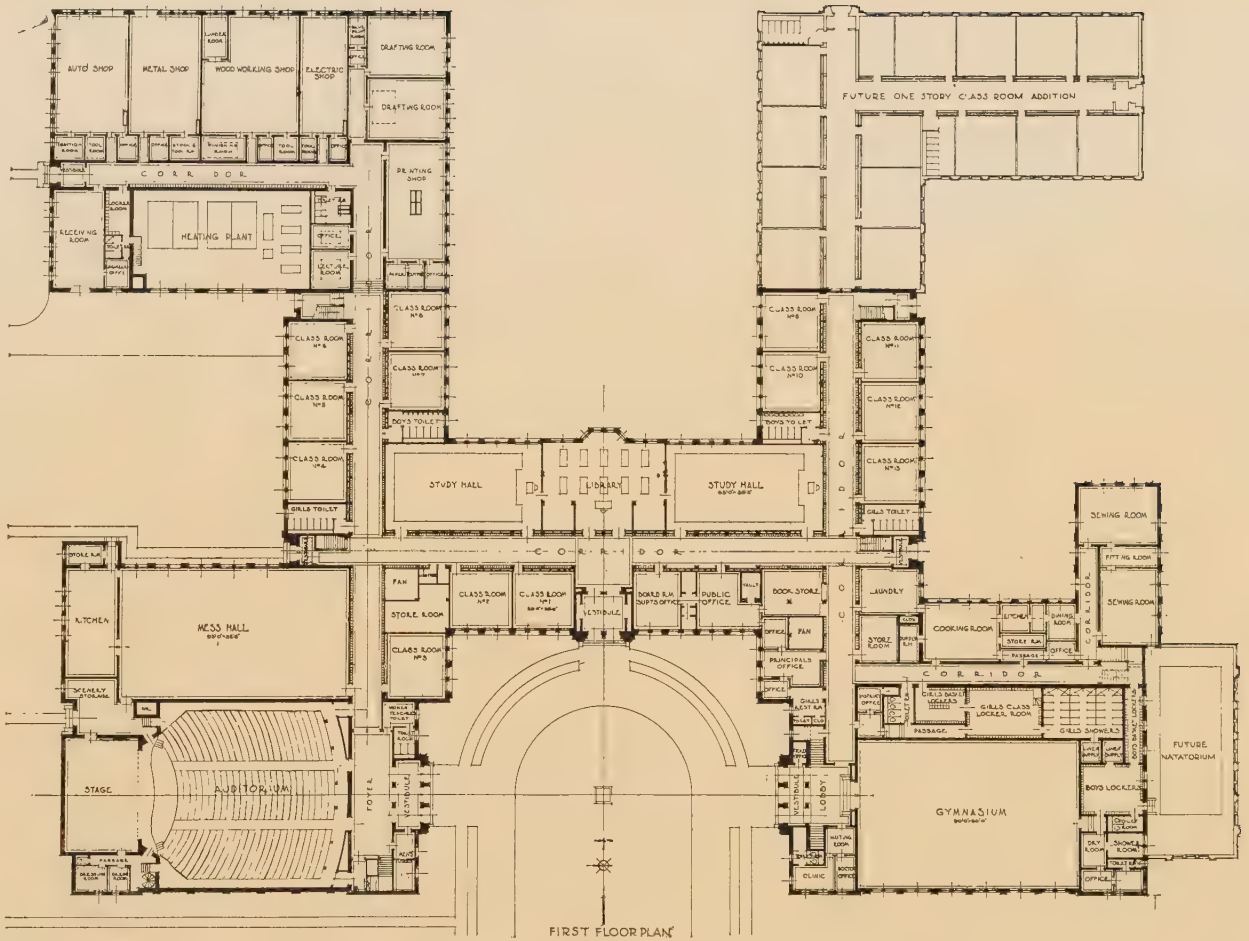
A CORRIDOR

The Manitowoc High School was completed in 1923 at a cost of $532,052.00. It contains 2,046,873 cubic feet, showing a unit cost rate of 26 cents per cubic foot. The building accommodates 1000 pupils, establishing a cost price per pupil of $532.00. The building is of fireproof construction throughout except the roof.

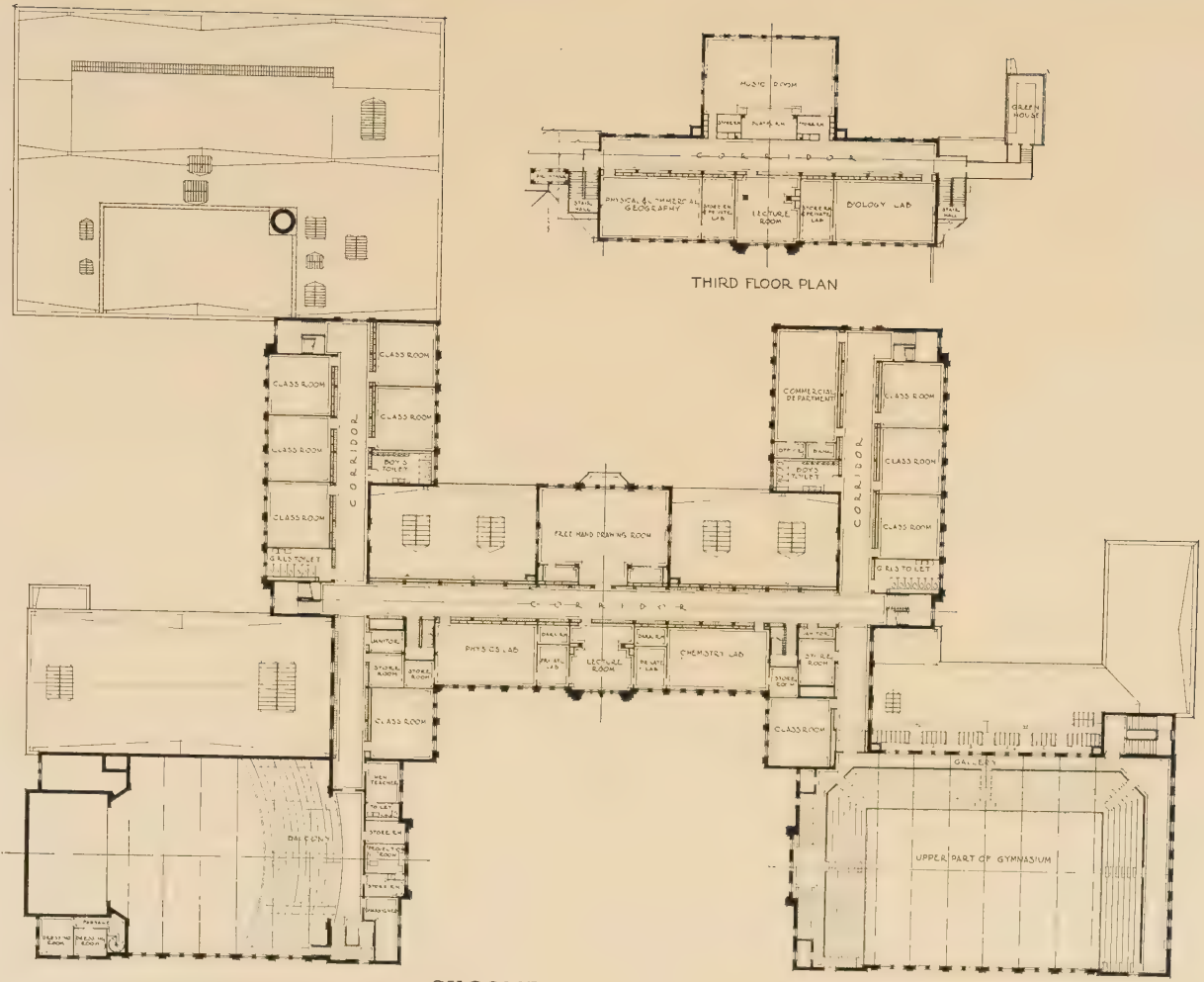
Manitowoc High School. Exterior of Gymnasium Entrance. For illustration of interior see page 196.

Manitowoc High School.
Exterior of Auditorium Entrance. For illustrations of interior see pages 211 and 212.

The Mishawaka, Ind., High School is prominently situated fronting the Lincoln Highway as it enters Mishawaka from the east. Its style is early Gothic. It is constructed of rough face brick of dark red shades and trimmed in light buff terra cotta.



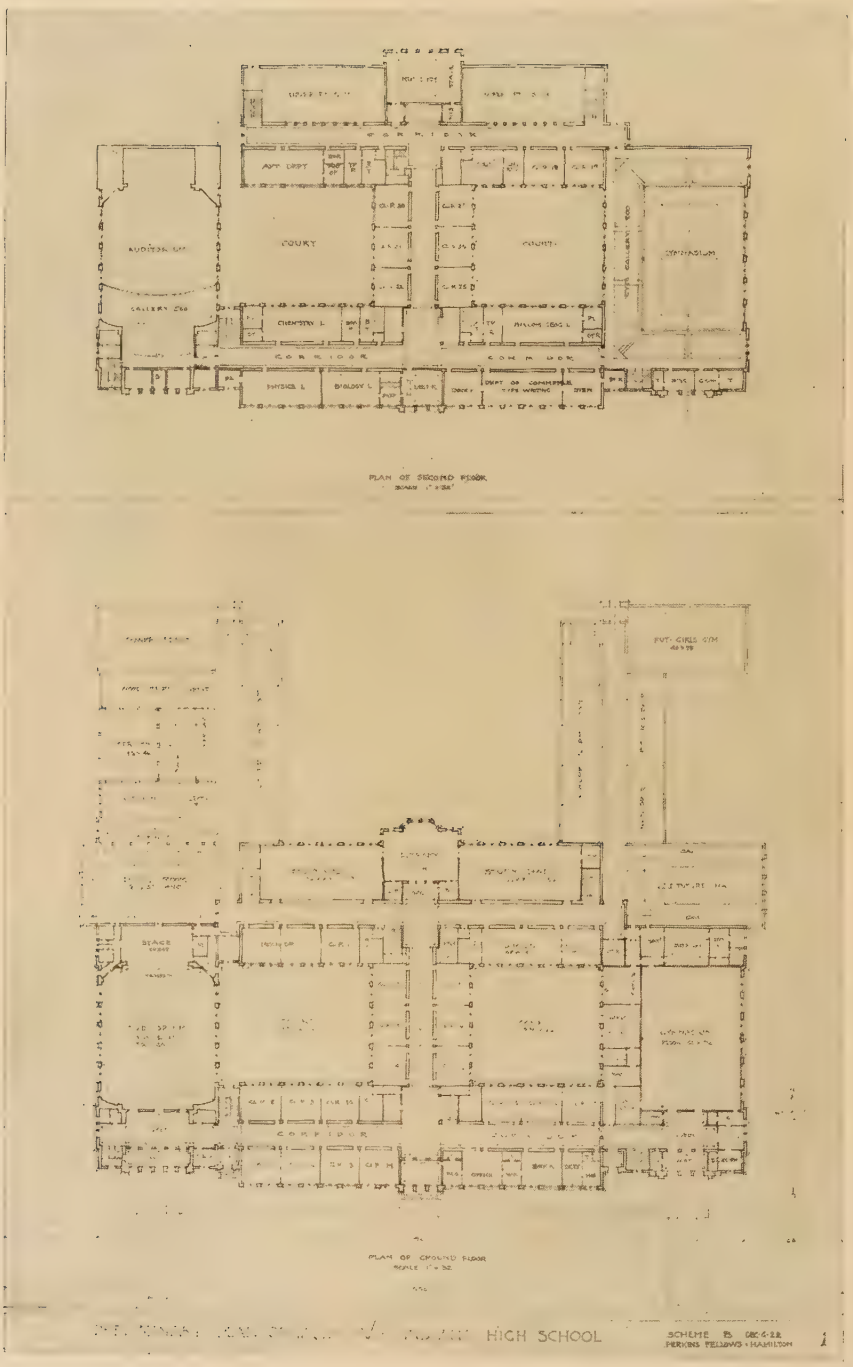
The Mishawaka High School is entirely of fireproof construction, contains 2,492,338 cubic feet and was constructed at a total cost of $722,387.00, showing a cost rate of 29 cents per cubic foot; 1150 pupils are accommodated, giving the cost of the building per pupil $628.00. For interior illustrations of Auditorium see pages 214, 215 and 216. For interior illustration of Gymnasium see page 195.



THIRD FLOOR PLAN

SECOND FLOOR PLAN

The Mishawaka High School was constructed in 1924 and consists of a main or academic section, a gymnasium wing, an auditorium wing containing mess hall as well, and a manual training wing combined with the heating plant. Ample facilities are provided for future extensions.



A very interesting preliminary study of the plan of the Mishawaka High School is here presented. It differs quite radically from the plan afterwards built.

Interior of Library.

The Grouping of the Library between the two large Study Halls in the Mishawaka High School is a feature worthy of special note.

The Entrance Tower of the Mishawka High School is of early Gothic design, almost Romanesque in character and sounds the dominant note to the architectural composition. Its trimmings are of a light buff color in coarse texture and varying shades.

Detail of Main Entrance, Mishawka, Ind., High School.

Evanston High School

THE Evanston Township High School, Evanston, Ill., is one of the largest and most important of such institutions in Cook County, outside of Chicago. Although the institution is quite an old one, its largest period of growth has been in recent years. The district served by it is approximately four miles long, bordering on Lake Michigan and less than two miles in width.

Prior to the construction of the new buildings, serious consideration was given to the question of establishing two high schools in this district in the place of one. This idea however, did not prevail and a very large site, comprising fifty-five acres of level land in the west central part of the city was purchased for the purpose of building a central high school which would meet all requirements of the district for many years to come and would be capable of expansion to an ultimate capacity of 4,000 pupils or more.

The City of Evanston has long been a community of cultivation and learning, being the seat of the Northwestern University. The tradition of the Evanston High School is that of a secondary school, primarily intended to prepare its pupils for college entrance. The system of administration in the Evanston High School differs in some respects from that of the more typical modern high school. A study hall accommodating 250 pupils is provided for each five class rooms and each of these groups is under the guidance of a group supervisor,

whose office adjoins the study hall. There are six such study halls now in use.

The central section of the building is taken up with the rooms for the science departments with the administration suite in the front central part flanked by the two main entrances and opening on to the delightful social halls. Above the administration suite is a magnificent library which extends through two stories. The main gymnasium and accessories has been constructed, leaving the girls' gymnasium and natatorium for future additions. Details and illustrations of the gymnasium will be found on pages 198 and 199.

The auditorium wing, including the permanent lunch room has not yet been built. A large temporary wood structure has been built to fulfill the Mess Hall requirement and to house the Manual Training Shops pending the construction of the permanent quarters for them.

All of the buildings are heated from an isolated boiler plant placed 800 feet away and having switch track facilities. See illustrations on pages 243 and 244.

The portion of the main or academic section now built contains 3,403,151 cubic feet and cost, exclusive of educational equipment, $1,156,000.00 showing a cost per cubic foot of 33.9 cents.

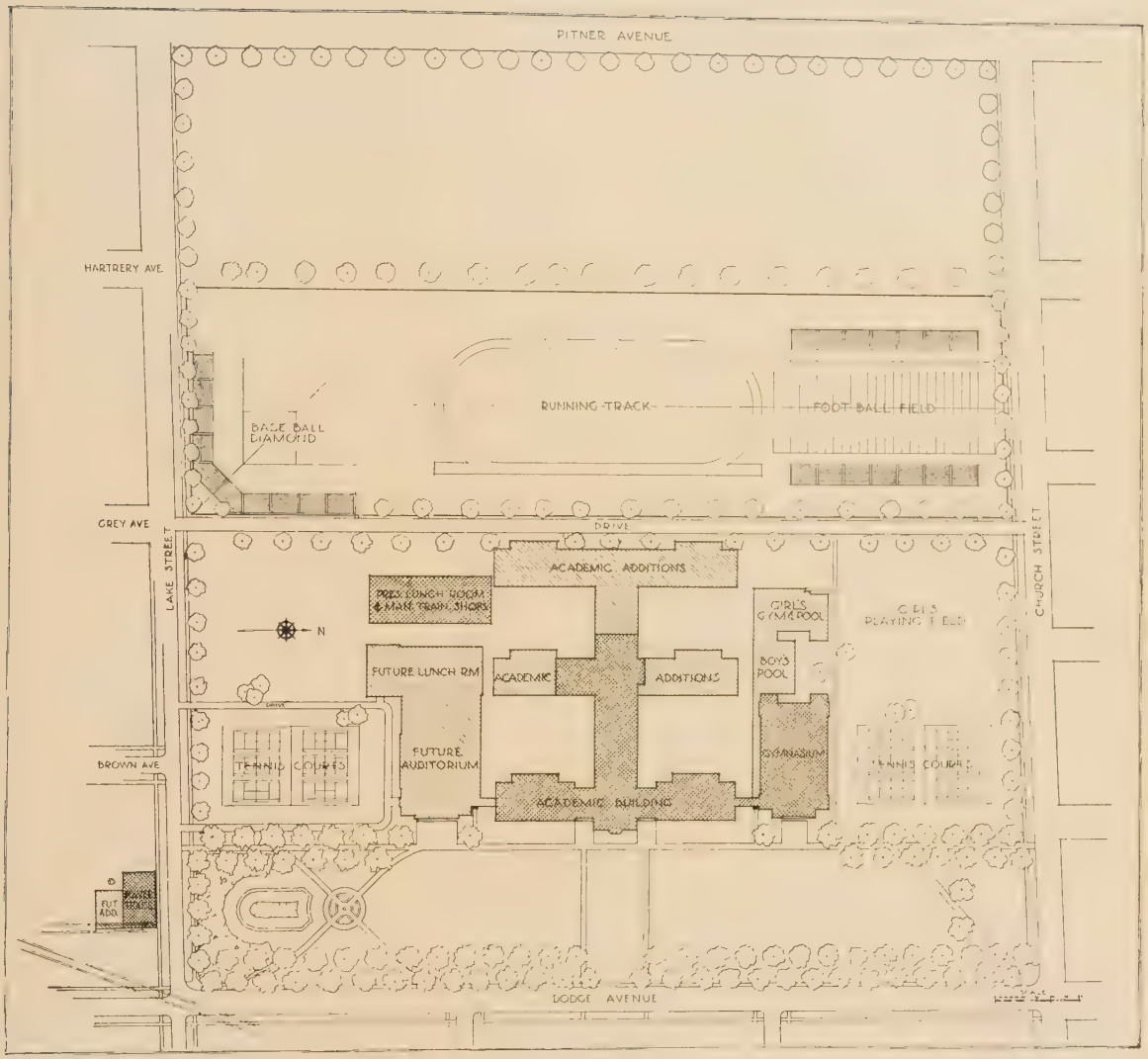
The Pipe Tunnel and Power House construction cost $127,200.00 and the equipment contained therein $160,500.00, making a total for Power House and Equipment of $287,700.00

The temporary Mess Hall structure cost $21,-

300.00 and its Equipment $32,400, showing a total for this department of $53,700.00.

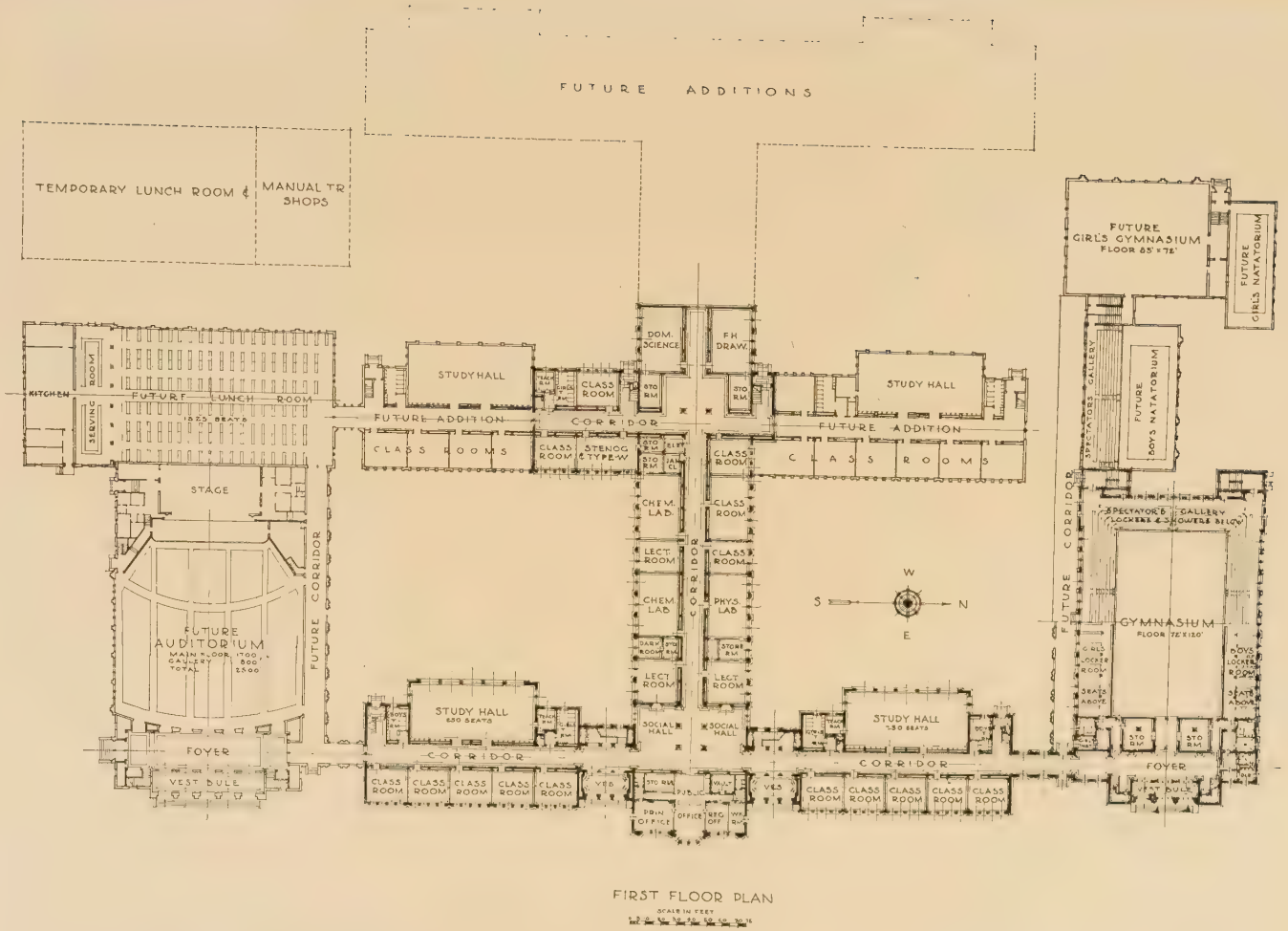
The cost of Gymnasium and Passage connecting it with the Academic Building was $313,300.00. The Gymnasium contains 921,414 cubic feet, which indicates a unit cost of 33.9 cents per cubic foot. The unit cost of both Academic and Gymnasium Sections with cost of separate heating plant apportioned to them was 37.1 cents.

The total of the above construction costs are approximately $1,800,000.00 for the 1,800 pupils now enrolled, showing a unit price of $1,000.00 per pupil.



The Evanston, Ill., Township High School is built on a site of unprecedented size, 55 acres being included. This not only provides ample space for present and future building requirements, for tennis courts and other playground activities, for the main athletic field and practice fields for athletic teams, but an ample piece of ground still remains to be developed for garden and agricultural purposes.

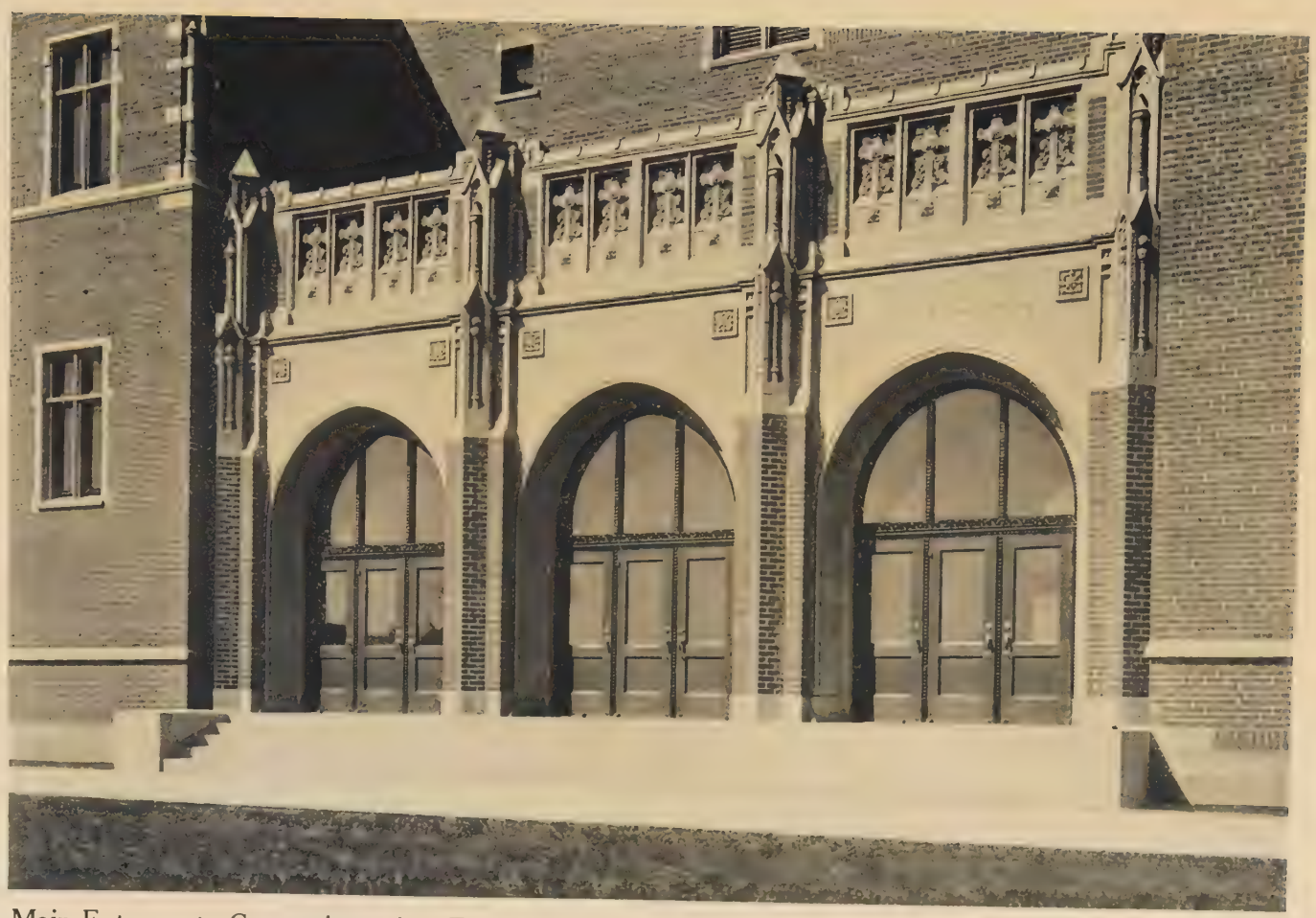
The Academic Building of the Evanston Township High School, designed in modern adaptation of Gothic style presents an imposing east front with well defined exterior expression of the functions of its component parts. The Gymnasium wing is on the right, the Auditorium wing will be on the left when built.



FIRST FLOOR PLAN

It will be seen at a glance that the Evanston, Ill., Township High School is planned not only to accommodate a large present attendance but to provide for future growth on a great scale. The buildings, when completed, will cover a rectangular piece of ground approximately 800 feet long by 500 feet wide.

The two Towers at Evanston High School are placed over the main Entrances, which are separated to provide for Office, Library and Music Departments in the Section between them.

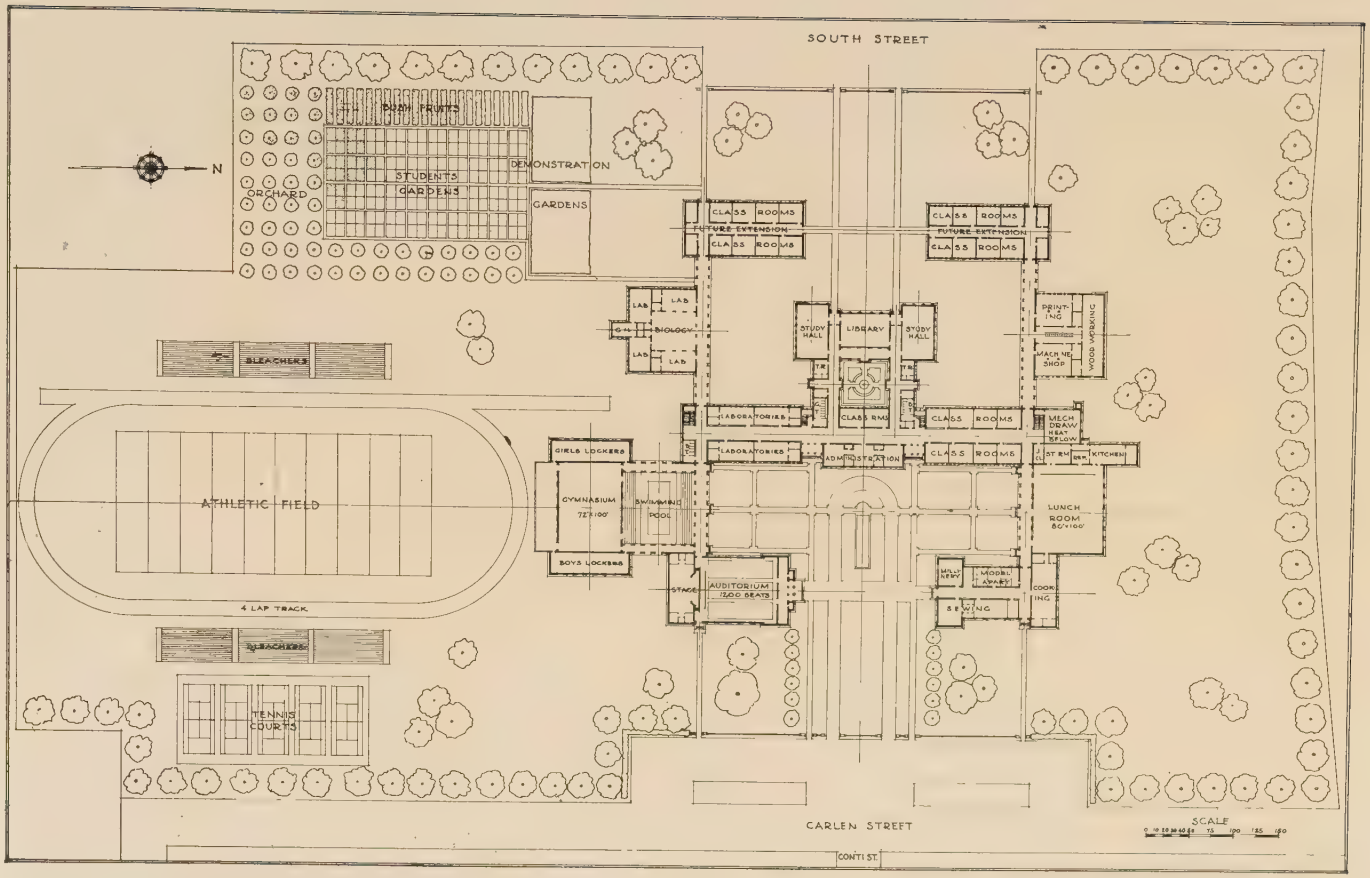


Main Entrance to Gymnasium wing, Evanston Township High School. The large seating capacity of the galleries of the Gymnasium requires entrance and stair capacity similar to that of an auditorium. The Gothic detail of this Entrance is executed in pulsichrome terra cotta modeled under Mr. Emil Zettler's direction.

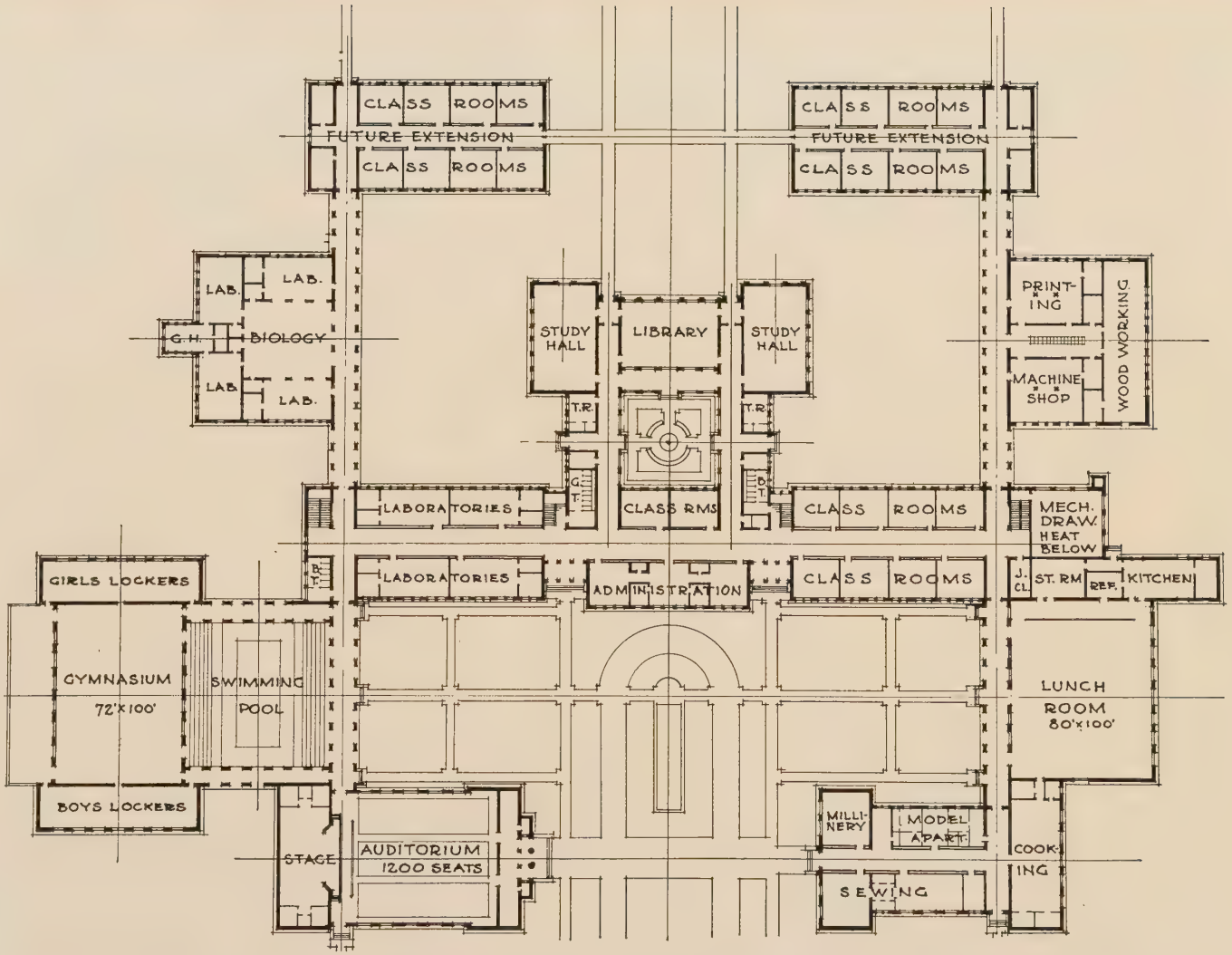
Detail of Brick and Terra Cotta work on the upper portions of Towers, Evanston Township High School.

Interior of North Vestibule, Main Entrance to Academic Building, Evanston, Ill., Township High School. The color and texture of this combination of brick and terra cotta is especially effective, light buffs and bronze predominating.

The Library at the Evanston, Ill., Township High School is a room of truly noble proportions, expressing its functions in a simple and dignified manner. Bookcase space for 15,000 volumes is provided, with adjoining rooms for the use of librarian and assistants.



General Plan of Building and Grounds, Mobile, Ala., High School, under construction at date of publication.



Group Plan of Buildings, Mobile, Ala., High School. A school for 2000 students which will cost, exclusive of future additions, $850,000.

General bird's-eye Perspective View, Mobile, Ala., High School under construction at date of publication. A southern type of high school group in Spanish style. Mr. George B. Rogers, Architect, of Mobile is Associated with the Authors.

SECTION IV

College Buildings

Illustrating

Wartburg Theological Seminary, Dubuque, Iowa

Divinity Hall, Capital University, Columbus, Ohio

University Group of Nanking, China

Department of Education Building, University of Michigan, Ann Arbor

University of Dubuque, Iowa

Designed by

PERKINS, FELLOWS AND HAMILTON

Architects, Chicago

Hitchcock Hall, University of Chicago

DWIGHT H. PERKINS, *Architect*

College Buildings

THE problem presented by the American College is one of the most difficult and interesting with which an architect comes in contact.

These institutions are usually blessed with some old buildings located in the most important positions on the campus and often constituting an obstacle to future growth. These buildings, built at various times of need and under pressure of economy, have seldom anything in common, having been built in various styles of architecture and of different materials. They are not readily adaptable to modern uses, yet have associations that endear them to the alumni. Moreover, because of the present cost of building it is not advisable to destroy any usable educational space.

Most of our State Universities are examples of institutions which have so far outgrown successively conceived plans for their development that any hope of complete and harmonious unity must be abandoned. The result is that they present at best museums of styles and building materials.

Careful study of the future needs of such institutions to the end that they may develop in an orderly way is imperative. As the old buildings must be used, they must be so incorporated in the plan that their ultimate replacement is provided for. Eventually the plan must accomplish a harmonious composition of buildings in arrangement, in style

and in materials of construction. Lack of sufficiently broad foresight and adequate funds with which to buy land in large areas for future development have, together with changes in personnel of those in authority, rendered futile or ineffective many apparently well formed plans for college growth.

Would it not be better to develop these large institutions, these universities, as a series of colleges like Oxford? One could imagine each department with its own quadrangle and each quadrangle associated with its related department and to the administration and facilities used in common. Each department could then have adequate provisions for future growth without impairment of its relation to the plan.

This is even more true of the smaller college. The American idea of distinctly separated buildings is wasteful of space, expensive in construction and adds materially to the cost of operation and maintenance.

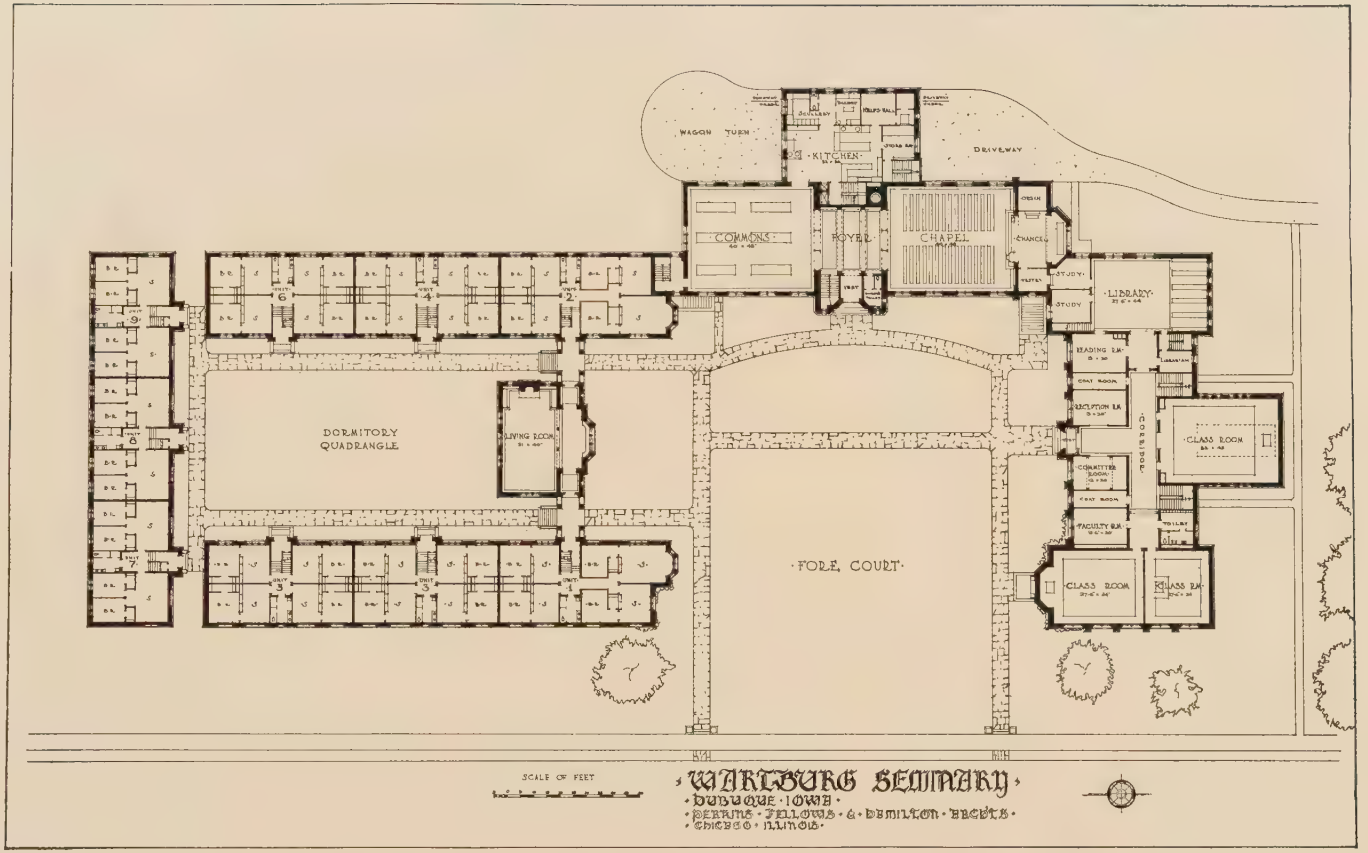
Every college should have a complete and careful study made of its probable future educational scope and expansion. It should have a group plan so that each new building will become a unit in a future comprehensive scheme of development.

There are some fortunate institutions that find themselves in a position to build new groups of buildings on new and adequate sites. These are an architect's joy and his compensation.

The University of Nanking, China, is a Christian University operated under the Presbyterian Board of Foreign Missions. This is a case where the architects were required to solve the problem in terms of Chinese architecture adapted to educational buildings. Materials and workmen were all Chinese and the surroundings Chinese. The result is that at least it is an improvement on the so-called "foreign" building of China. The brick are three hundred years old and the buildings in color and in design harmonize with the landscape.

Harmony of color is as important as architectural design and composition and the best results are seldom attained by the use of the most expensive materials brought from a distance.

Wartburg Theological Seminary, an institution of the Luthern Church, at Dubuque, Iowa, was built in 1915 and 1916. It comprises a central structure containing Chapel, Dining Hall and Service Quarters and is surmounted by a rugged mediaeval Tower of similar character to that of Martin Luther's Wartburg Tower of the olden days. The entire group of buildings is built of sedimentary limestone of light buff color and quarried on the site, a few yards away from the buildings. The trimmings are of Indiana limestone. The group stands on a prominent elevation of ground and can be seen for many miles around.

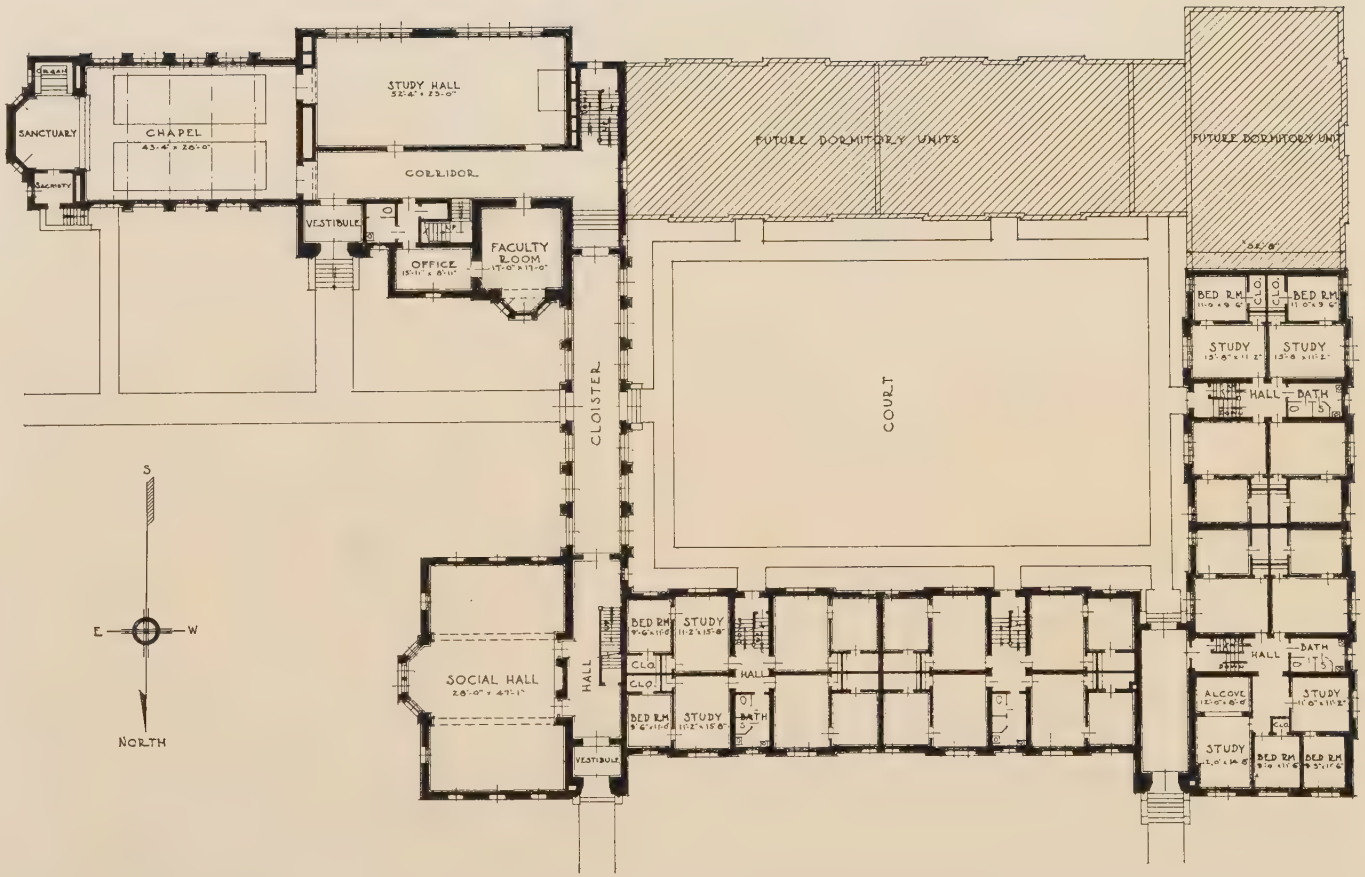


The Wartburg buildings, omitting certain dormitory sections which were not constructed, contain 1,076,484 cubic feet, and were built at a cost of 16.23 cents per cubic foot, or a total cost of $175,441.99.

View into Court Yard, Wartburg Seminary. The small building with the cupola is the Club House situated at the head of the Dormitory Quadrangle.

The Chapel, Wartburg Theological Seminary, Dubuque, Iowa. For illustration of mess hall see page 230.

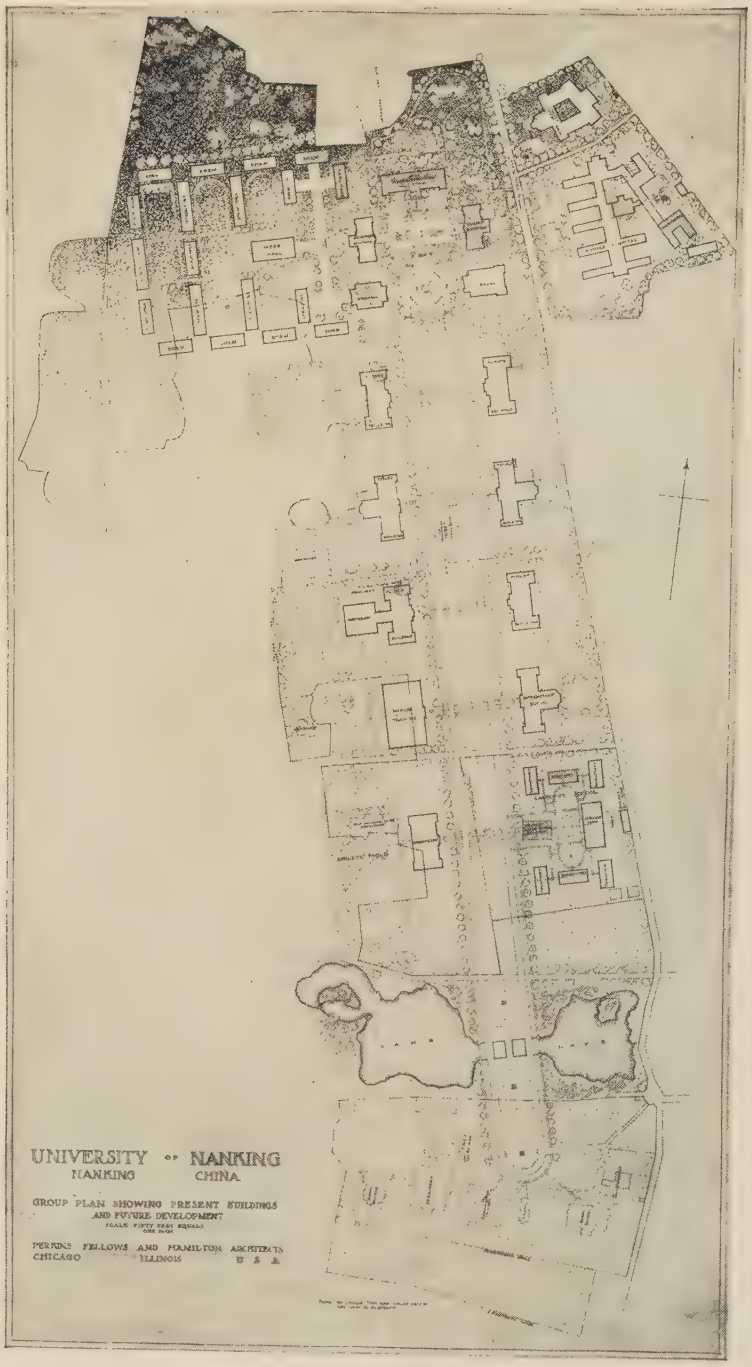
The Divinity Hall Group of Capital University is a part of a large and growing group of buildings of that progressive Lutheran Institution. Capital University is just outside of the eastern limits of Columbus, Ohio. These buildings are constructed of dark red and brown brick with light buff terra cotta and consist of a group of Dormitories of the Oxford type with Library and Club Rooms connected by a Cloister to the Seminary Section of which the Tower is a part and to which the Chapel adjoins.



Divinity Hall, Capital University, was built in 1922. It contains 620,000 cubic feet and cost $197,860.00, showing a unit price of 32.9 cents per cubic foot.

View of Library and Club Room Section of Dormitory Group, Divinity Hall, Capital University, Columbus, Ohio.

View of Chapel and Seminary Section, Divinity Hall, Capital University, Columbus, Ohio.



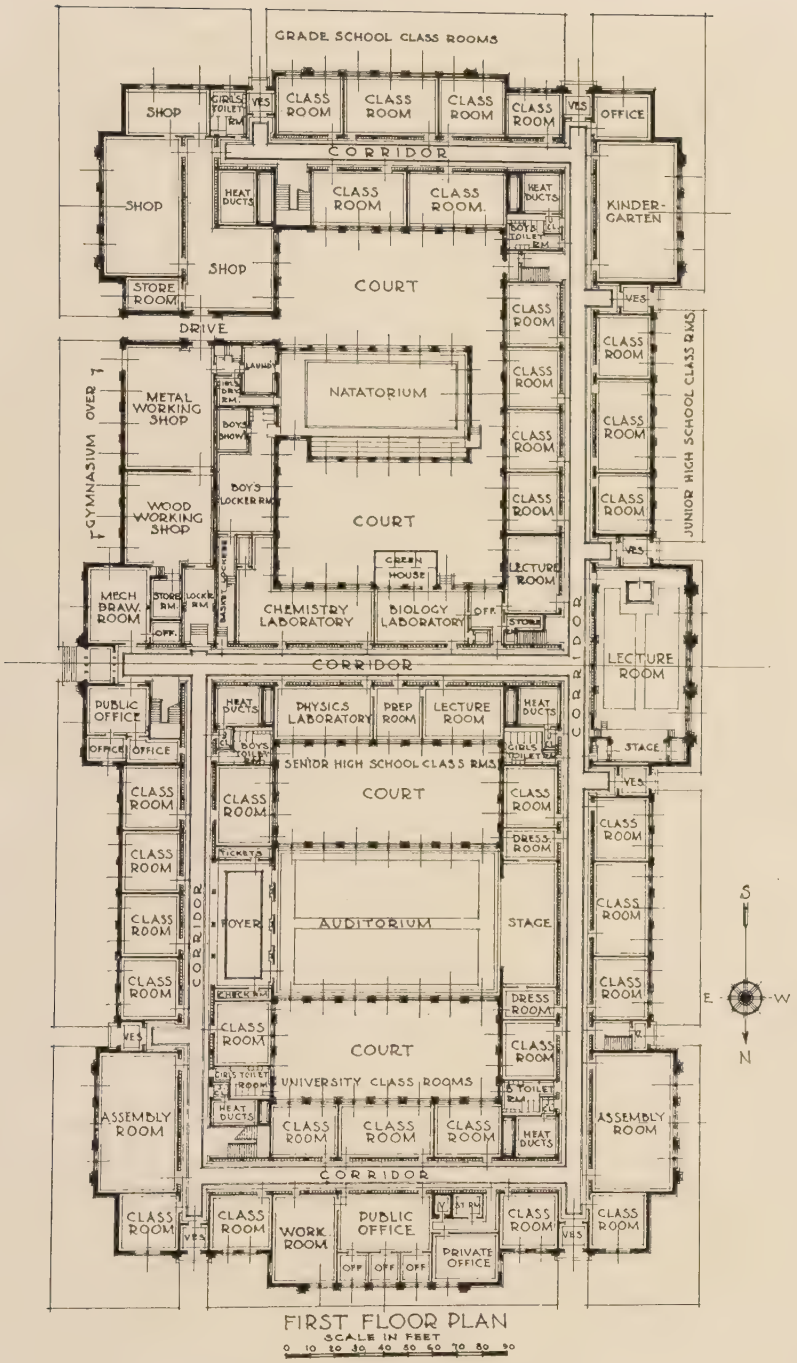
Plan of the Campus of the University of Nanking, China. The new University group is at the top of the plan, of which six buildings have been built. At the right of the group is the medical school and hospital. The old buildings at the bottom of the plan are used as an intermediate school.

University of Nanking, general view. The new group of six buildings is built upon a natural acropolis at the north end of the mile long Campus. The buildings in design and materials of construction conform to Chinese precedent adapted to educational building requirements.

Severance Hall of the University of Nanking is the main building of the group. It is built of Chinese gray brick and white marble with a roof and cresting of Chinese Temple tile. The buildings at the left are part of the McCormick Dormitory Group.

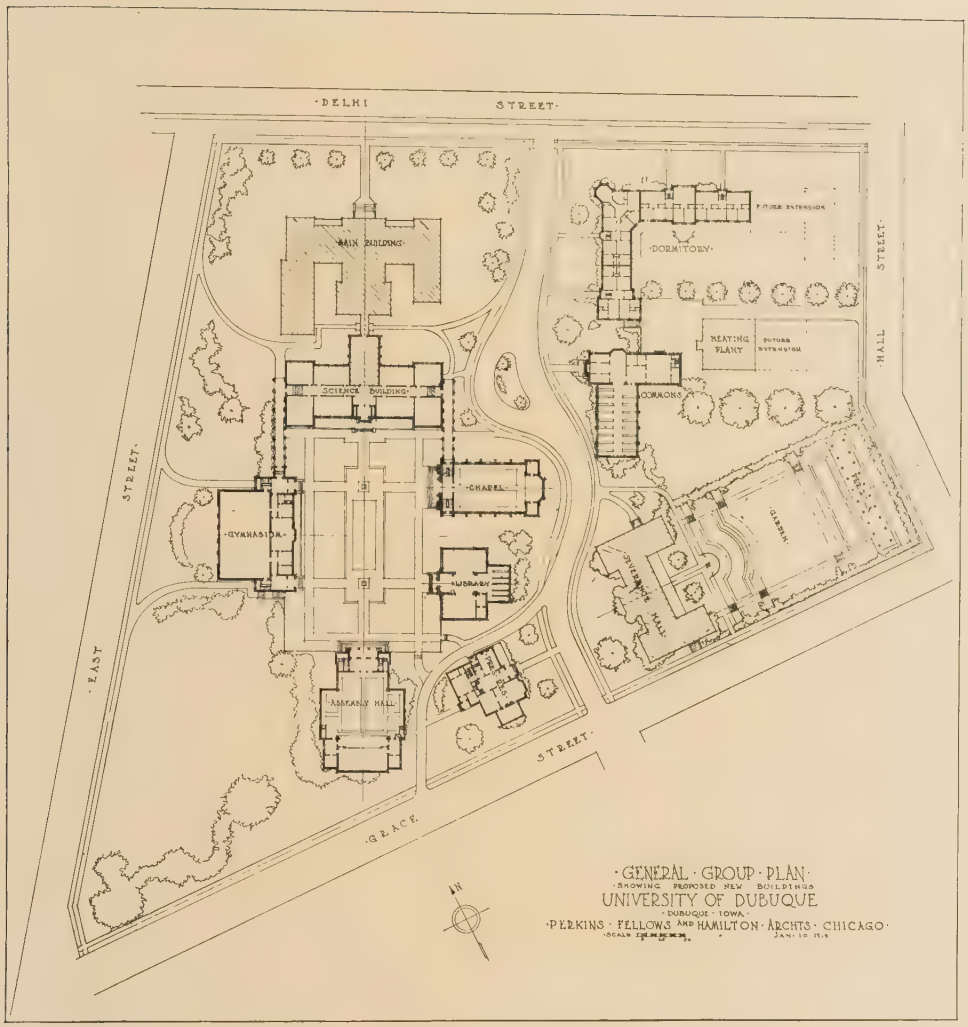
At the right and left of the main building are two Science Buildings similar in design. This one is used for Physics and Chemistry and was presented to the University of Nanking by Mr. Ambrose Swasey, of Cleveland.

Day Chapel of the University of Nanking is on a lower terrace and opposite to the Library site. Its Auditorium seats one thousand.



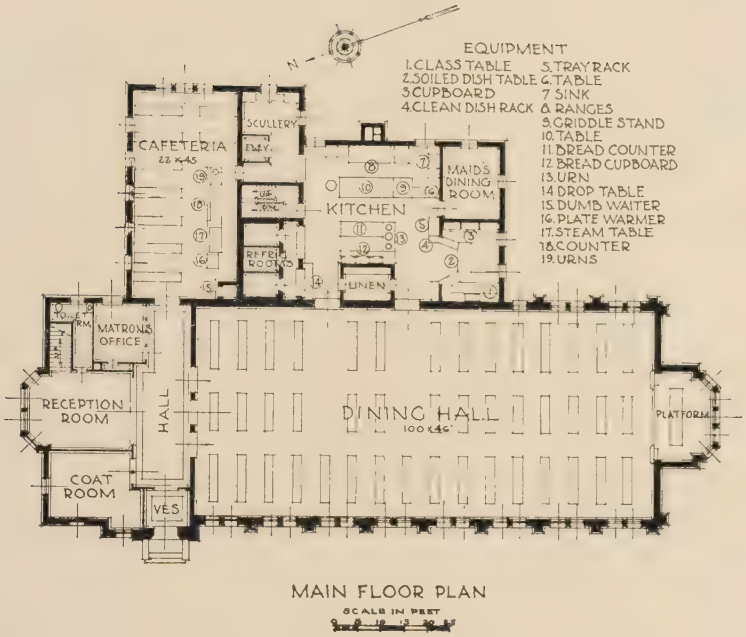
A plan for the completion of the Department of Education of the University of Michigan. The central unit of this plan has been completed at a cost of $490,000.00.

The first section of the building for the Department of Education, at the University of Michigan, was completed in 1923. It is part of a building which will occupy a block south of the University Campus.



The University of Dubuque, Iowa, is a Presbyterian Institution, situated west of the center of the city. This group plan was made for the purpose of further development of the Institution and called for a careful study of the then present structures and the location of new ones to be built. Of the new buildings shown on this plan, two have been constructed — the McCormick Gymnasium and Peters Commons, which are shown on the following pages. For illustration of the interior of Peters Commons see page 154. For illustration of the interior of McCormick Gymnasium see page 186. For illustration of the interior of the Natatorium see page 201.

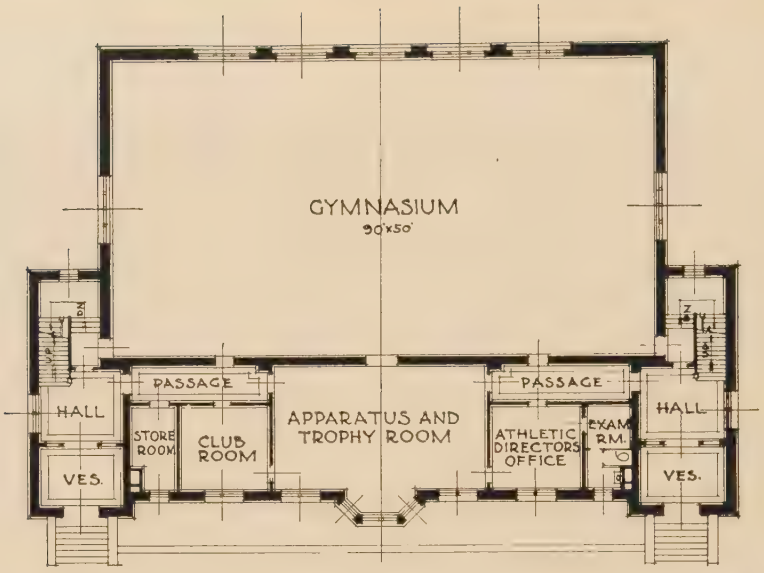
Peters Commons, University of Dubuque, Iowa.



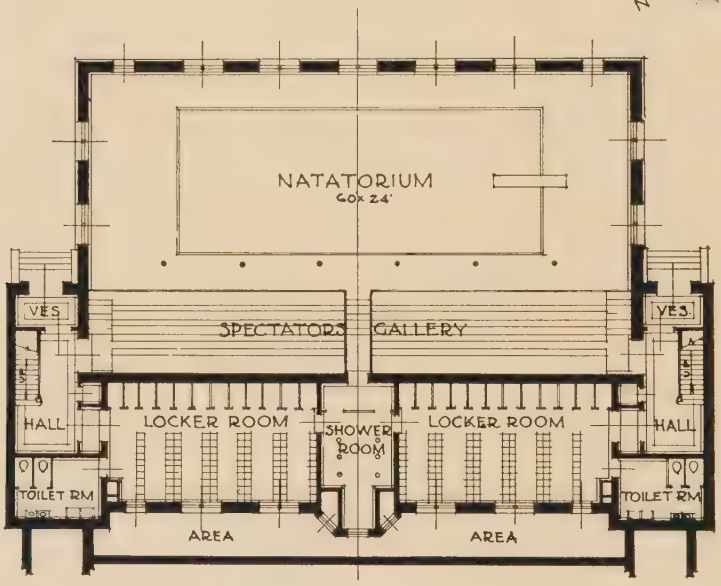
Peters Commons, University of Dubuque, was built in 1916 at a cost of $51,510.70. It has a cubic contents of 351,960 and its cost per cubic foot was 14.65 cents. The Commons Building is designed for a students' daily dining place as well as for general social use on special occasions. The main Dining Hall has a normal seating capacity of 420, with a faculty dining table placed in the bay window at the end of the Hall. A Cafeteria accommodating one hundred at a time is also provided. A Kitchen, complete with all modern equipment, serves these two rooms. A Steam Laundry is constructed under the Kitchen and large storage and supply rooms for linens are on the second floor.

Interior of Dining Hall, Peters Commons, University of Dubuque, Iowa.

The McCormick Gymnasium, University of Dubuque, Iowa, is situated on a hillside on the west side of the new Quadrangle. This affords ample side light from the west for the Natatorium rooms.



MAIN FLOOR PLAN

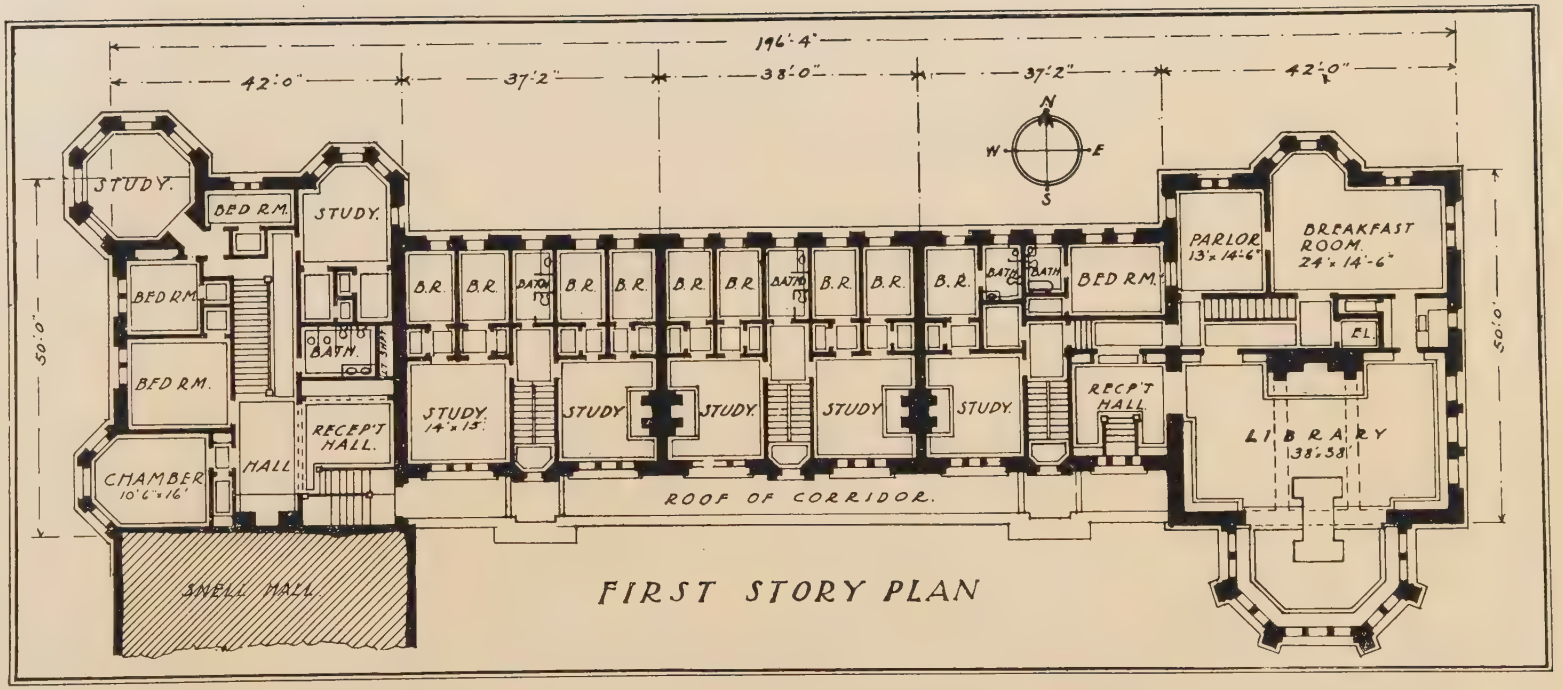


NATATORIUM FLOOR PLAN

SCALE IN FEET
0 5 10 15 20 25

The McCormick Gymnasium, University of Dubuque, was constructed at a cost of $60,000.00. Its cubic contents is 323,570 cubic feet, showing a unit cost rate of 18½ cents. For illustration of interior of Gymnasium see page 186. For illustration of interior of Natatorium see page 201.

The northwest corner of Ellis Ave. and Fifty-Seventh St. is the site of Hitchcock Memorial, a residence for one hundred men students at the University of Chicago. The main front is the view here shown, which faces south on the campus.



In plan Hitchcock Hall consists of five Dormitory Units of the "Oxford type," separated by brick walls and connected by the corridor-vestibule on the ground level. In some stories the rooms are as shown above, in others the space of each "Unit" is divided into four separate rooms, accommodating the same number of students but in single rooms. This Dormitory forms a group with Hull Biological Laboratories on the east and the Snell Dormitory on the south.

All of Charles Hitchcock's personal books and pictures are housed in this Memorial Library, which is common to all sections of the house. A breakfast room adjacent on the north and rooms for the "house mother" add a touch of home life for all occupants of the building.

SECTION V

Park Buildings

Illustrating

Refectory and Boat House, Lincoln Park, Chicago

Lion House, Zoological Garden, Lincoln Park, Chicago

Chicago Daily News Sanitarium, Lincoln Park, Chicago

Gymnasium and Field House, Hamlin Park, Chicago

Gymnasium and Field House, Seward Park, Chicago

Designed by

PERKINS, FELLOWS AND HAMILTON

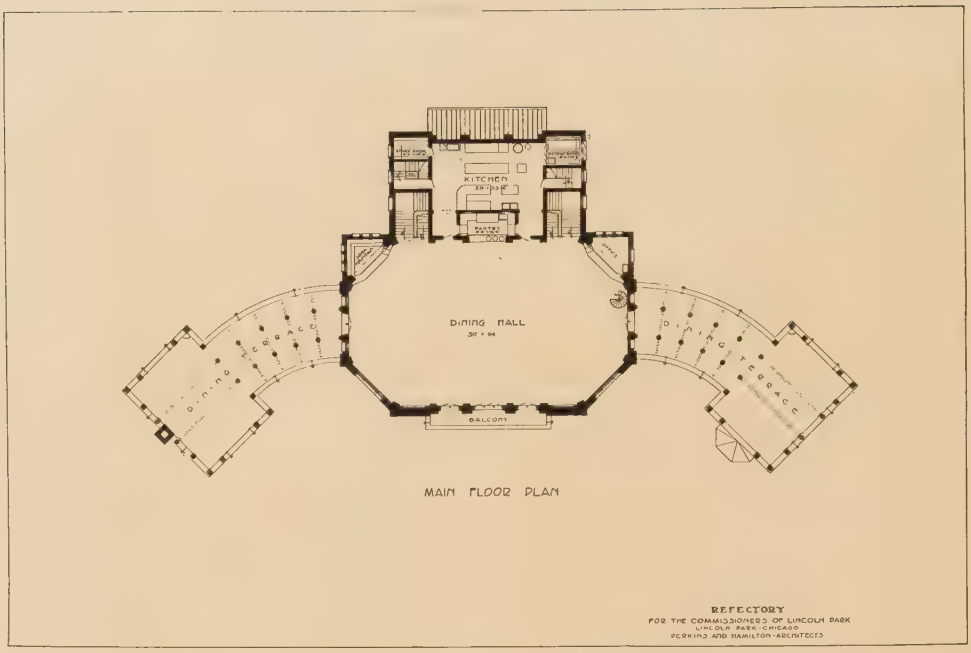
Architects, Chicago

View of Lagoon from out-of-door Dining Terrace, Lincoln Park Refectory.

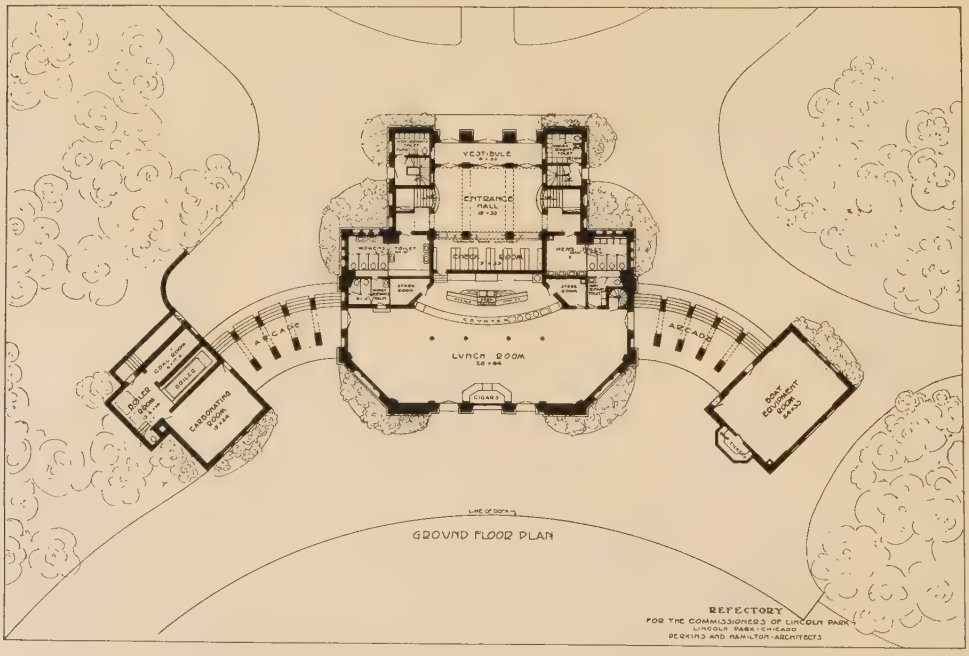
Park Buildings

OF necessity, the public parks of a great city are required to have certain buildings for the convenience of the people and the administration of the park. A common tendency toward placing public buildings in public parks is resisted strongly by those who have a correct comprehension of the true purpose of such a park. Mr. Bryan Lathrop, for many years Vice President of the Lincoln Park Board, was one of these. Lincoln Park contains many buildings and, while he took great pleasure in the development of the design of these buildings, he regarded them all as necessary evils, as they all detracted from the outdoor effect of the Park itself. Where buildings were actually required, it was his idea that their color should be kept inconspicuous and, insofar as it was practical and appropriate, they should be screened by trees and planting. It was with the keenly intelligent and sympathetic co-operation of Mr. Lathrop that the services of the Architects were performed on these buildings.

Lincoln Park Refectory and Boat House afforded an exceptional opportunity for a tistic results. It is, on both exterior and interior, a careful study in colors and textures in brickwork. The roof is of green glazed tile.



For illustration of interior of Main Dining Hall see page 227



The Lagoon on which the Refectory is located is used for boating in summer and skating in winter. The public approaches the dock front through the curved arcades. The Lunch Room on the dock level is operated on a cafeteria system.

The Lion House in Lincoln Park was constructed to house the carnivorous animals who are displayed in indoor cages in cold weather and in outdoor cages in warm weather. Experience has shown that these animals must have the south sun to as large a degree as possible and for this reason, and to avoid confusion in handling the great crowds which visit the zoological gardens, the exhibits are placed only on one side of the great interior hall.

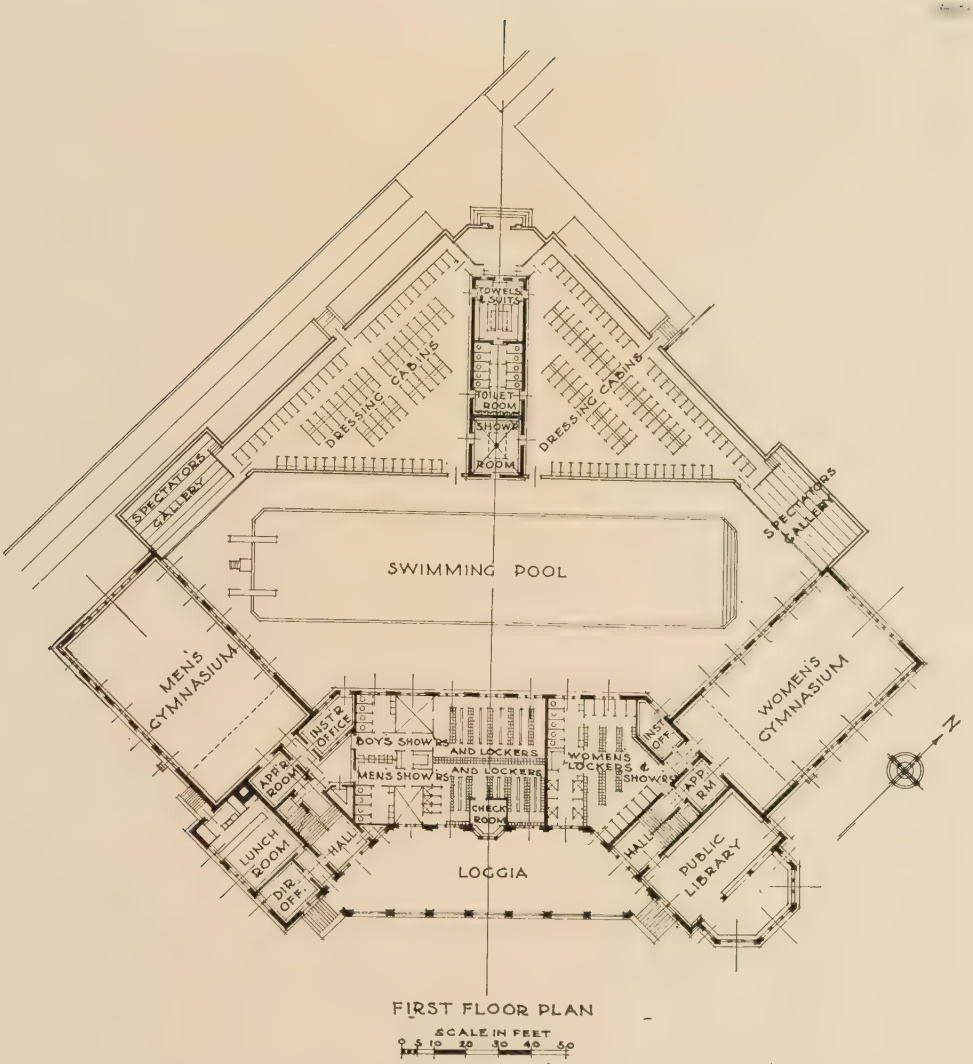
The Lion House is an intensive study of brickwork and other burnt clay products. The animal figures were made of standard sized brick especially selected for color and laid on a concrete slab on the ground in conformity with full size details prepared by the Architects. They were hoisted and set in one piece. Many special sizes and shaped blocks of brick were used in this building. The Illinois Chapter of the American Institute of Architects, in 1912, awarded to the Authors a gold medal for excellence of design of this building.

The Interior Hall of the Lion House is 186 feet long and 42 feet wide. The interior surface is entirely of glazed material. The wainscoting is a dark brown, the upper walls are a light buff of transparent glaze with cream white enamel trimmings. The Guastavino vaulted ceiling is cream tile. The walls in the animals' cages are of green glazed brick, the skylight and electric lighting systems over the cages are concealed in such a manner that they are invisible from outside of the keeper's rail. Fresh air is blown into the room from the ducts above the cage fronts and is exhausted just below the cage fronts. The tile mosaic floor has an incline of twelve inches and slopes to a gutter at the front of the cages.

Exterior of Open Air Pavilion, Chicago Daily News Sanitarium, Lincoln Park, Chicago.

The Chicago Daily News Sanitarium is located on an island in Lake Michigan separated by a lagoon from Lincoln Park. It is a summer sanitarium for babies for the purpose of providing fresh air, pure food, medical attention and instruction to mothers. It is operated by the Chicago Daily News Fresh Air Fund. In this great steel arched pavilion will be found in mid-summer two hundred and fifty babies lying in large wire basket cribs swung from the iron posts, as illustrated above and attended by their mothers or older sisters, while the children from four to eight years are amusing themselves on the terraces outside of the railings. In the east wing of the building are hospital rooms for the treatment and care of sick babies, also diet kitchens, laundry and nursery quarters. The Institution is operated as a day nursery and all of the babies and children, except hospital cases, are taken home each evening.

Hamlin Park is one of the group of small parks on the north side of Chicago, operated by the Commissioners of Lincoln Park. It is ten acres in extent and provides a general athletic field, a men's outdoor gymnasium, women's outdoor gymnasium and a children's playground. The field house, in addition to gymnasiums for men and women, has a lunch room, a dance hall, a branch of the public library and locker and bath rooms. In connection with the gymnasiums, an outdoor swimming pool 55x160 with all its accessories is a part of the plan.

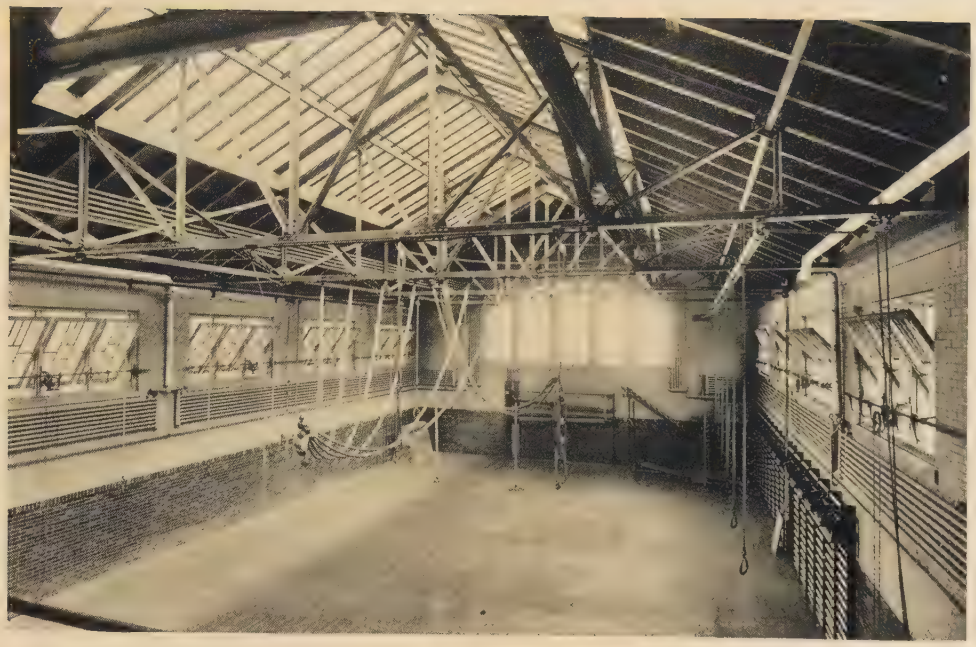


Field House and Gymnasium Building, Hamlin Park, Chicago

General View and First Floor Plan, Gymnasium, Seward Park, Chicago.

View of Swimming Pool, Hamlin Park.

View of Natatorium Dressing Booths, Hamlin Park.



View of Men's Gymnasium, Hamlin Park, Chicago.

General View of Field House, Hamlin Park, Chicago.

The Field House at Seward Park provides all the facilities offered by that of Hamlin Park, excepting the natatorium.

SECTION VI

Buildings for Physical Education

Illustrating

Grand Stand, Oak Park and River Forest Township High School Athletic Field.

Gymnasium and Assembly Hall, Bragg School, Fond du Lac, Wis.

Gymnasium and Assembly Hall, Elmer R. Webster School, Pontiac, Mich.

Gymnasium and Assembly Hall, Arthur H. Howard School, Wilmette, Ill.

Gymnasium, University of Dubuque, Iowa.

Gymnasium, St. Joseph, Mich., High School.

Gymnasium, Longfellow School, Lorain, Ohio.

Gymnasium, David Worth Dennis Junior High School, Richmond, Ind.

Gymnasium, Julia E. Test Junior High School, Richmond, Ind.

Gymnasium, Lincolnwood School, Evanston, Ill.

Gymnasium, New Trier Township High School, Kenilworth, Ill.

Gymnasium, Pontiac, Mich., High School.

Gymnasium, Bay City, Mich., High School.

Gymnasium, Thomas L. Handy Junior High School, Bay City, Mich.

Gymnasium, Mishawaka, Ind., High School.

Gymnasium, Lincoln High School, Manitowoc, Wis.

Gymnasium, Niles, Mich., High School.

Gymnasium, Evanston, Ill., Township High School.

Natatorium, New Trier Township High School, Kenilworth, Ill.

Natatorium, University of Dubuque, Iowa.

Natatorium, Thomas L. Handy Junior High School, Bay City, Mich.

Natatorium, Bay City, Mich., Senior High School.

Designed by

PERKINS, FELLOWS AND HAMILTON

Architects, Chicago

Buildings for Physical Education

THE whole subject of physical education in the United States has been viewed in a new light after the record of the army training camps during the world war. A greatly renewed interest in physical training was produced by that event and public agencies for physical training have accordingly expanded their activities.

The more recent developments are toward the employment as instructors, both men and women, of only those who have received careful and special training for the work.

Much of the German and Swedish exercising methods once generally in use in the schools have been abandoned and athletic games substituted. The use of elaborate apparatus in the gymnasiums of the public high schools has largely disappeared. The requirement of suspended running tracks is infrequently met and the demand for large seating capacity in spectators' galleries is more than ever in evidence.

The public interest in match games of college and high school teams is growing ever larger, so much so that the question has been raised whether these institutions are not engaged quite as much in amusing the public as in stimulating school spirit and physical education. Many of the colleges have built great stadiums of enormous seating capacity, most of which are used but for a few days in each year. This idea is now being taken up by high schools.

Although a few years ago only the best equipped senior high schools had real gymnasiums of ample size, such facilities are now required in every well

established junior high school and elementary school as well.

The gymnasium rooms in elementary schools are very frequently made to fill occasional requirements for assembly hall purposes. Such rooms are necessarily limited in size to a seating capacity of about 600, requiring the use of movable chairs and a level floor. These rooms are of necessity simple in architectural treatment with brick walls and a recessed stage. Some of them have permanently stepped galleries and a level floor which is either a playing floor when used as a gymnasium or a floor with movable chairs when used as an assembly hall. Although this arrangement is at times inconvenient, owing to moving the chairs and apparatus about, they still remain a very popular type for elementary schools and for temporary provision in high schools, and in junior high schools such rooms are usually excellent for gymnasium purposes and fair for assembly hall use.

Natatoriums are much desired and generally admitted to be a part of every well equipped high school. The natatorium is, however, the most frequently omitted feature on account of its initial expense and cost of operation.

The extensive small park system in the city of Chicago is one of the most important agencies for physical education in that city, providing healthful recreation centers for a large number of people beyond school age and with competent instructors in charge. The Authors have designed three of these small parks for the Commissioners of Lincoln Park. They were named for William H. Seward, Hannibal Hamlin and Gideon Welles, all members of President Lincoln's Cabinet.

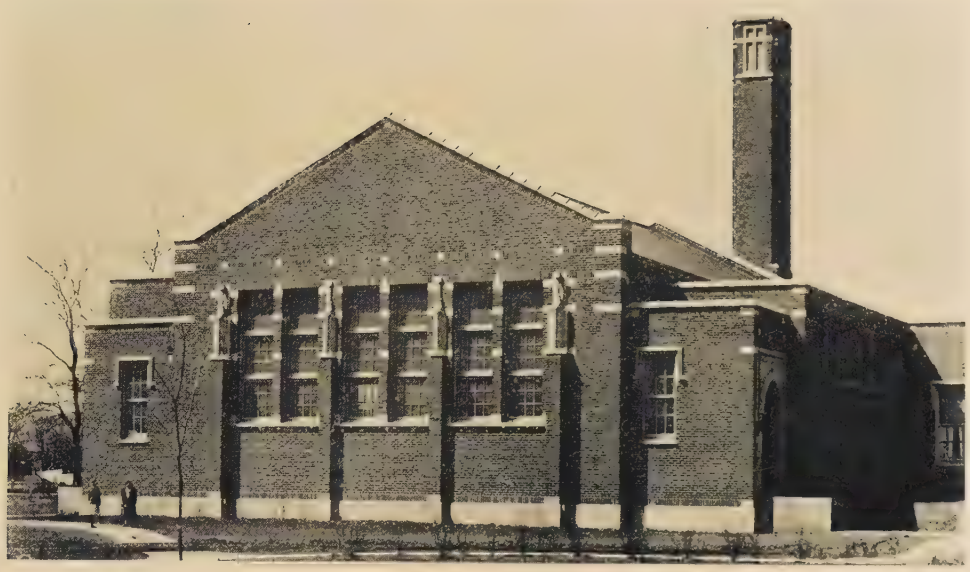
The Oak Park and River Forest Township High School is one of the largest and most important high schools in Cook County outside of Chicago. It has at present a pupil attendance of 1,800 and has taken a prominent position in the middle west high school and college athletics for many years. This institution had a fine athletic field presented to it some years ago by the citizens of Oak Park. The same public-spirited townspeople have recently financed the construction of a fireproof Grand Stand on this athletic field, capable of seating 6,000 people and containing field house facilities for contesting teams. This is the main entrance to the Grand Stand.

View of Oak Park High School Grand Stand from the southwest.

View of Oak Park High School Grand Stand from the field during a football game.

Gymnasium with Kindergarten stage combination and corridor galleries, Edward S. Bragg School, Fond du Lac, Wis. For general plan of building see page 23.

Interior of Gymnasium, Glencoe, Ill., Elementary School. The walls are faced with brown salt glazed tile.

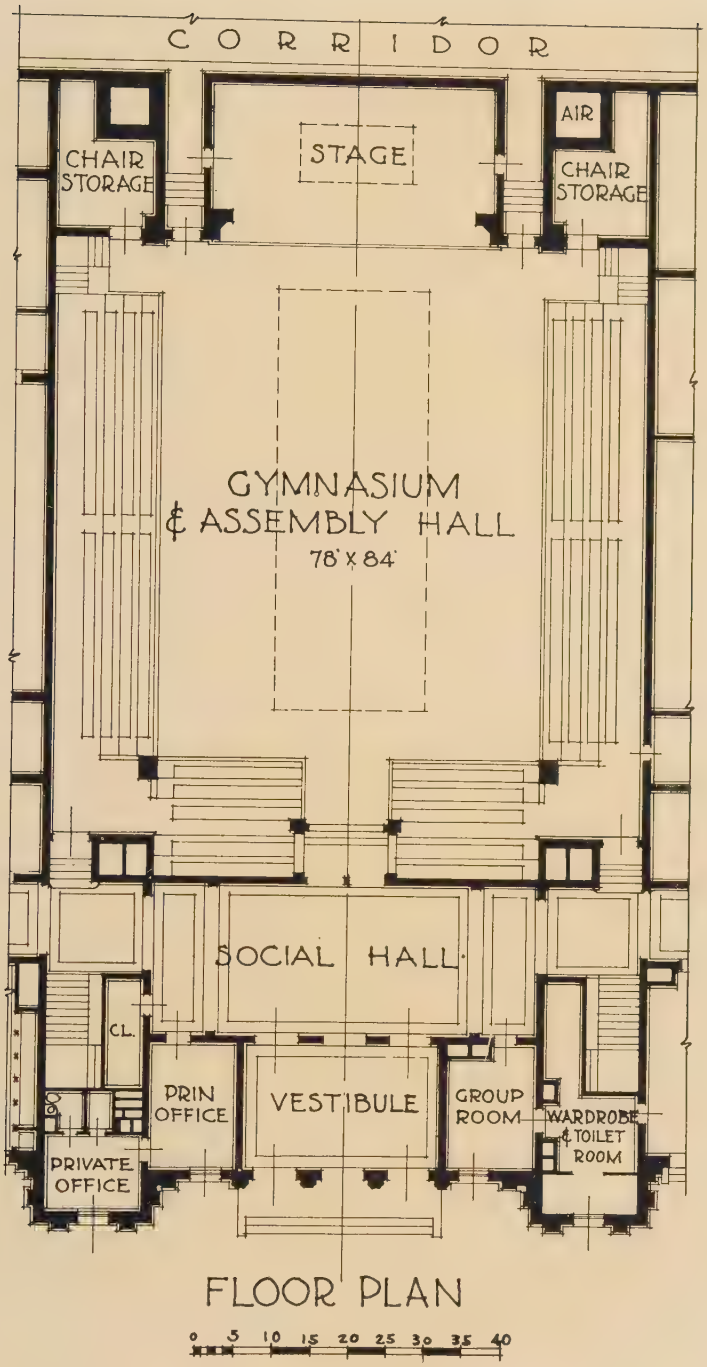


Exterior Gymnasium Wing, Arthur H. Howard School, Wilmette, Ill.

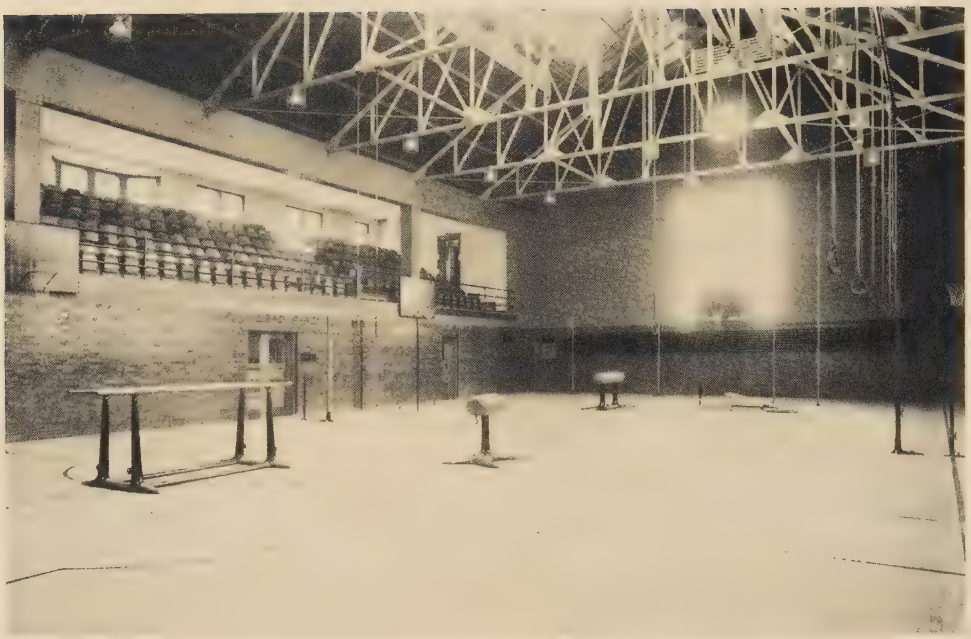
Entrance to Gymnasium Building, Alma College, Alma, Mich.

A large Gymnasium with Stage and permanent Galleries, in the Elmer R. Webster School at Pontiac, Mich. For general plan of building see page 33.

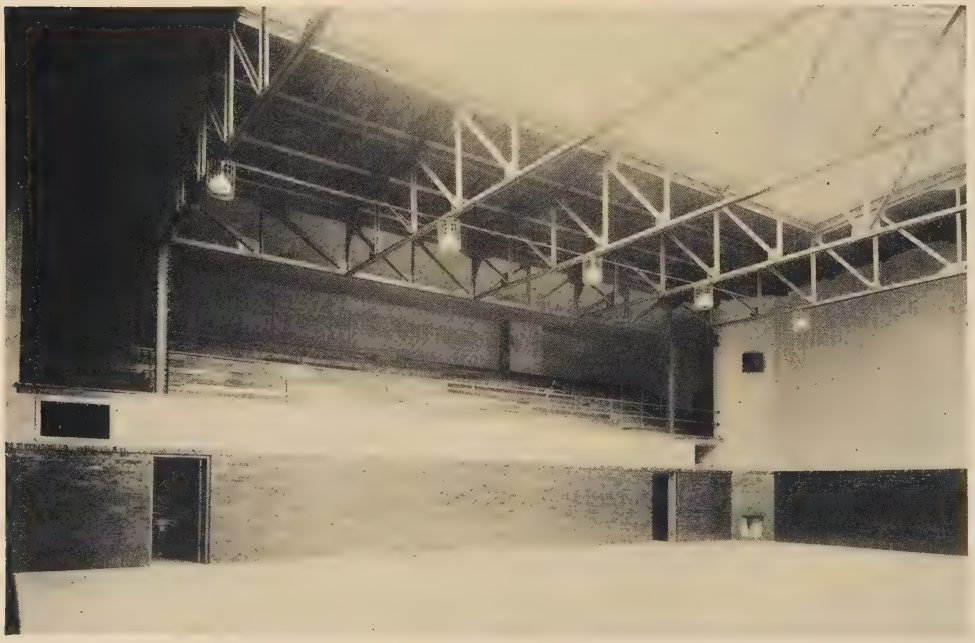
Interior of Gymnasium, Arthur H. Howard Elementary School, Wilmette, Ill. For general plan of building see page 40.



Plan of combined Gymnasium and Assembly Hall, Elmer R. Webster School, Pontiac, Mich.

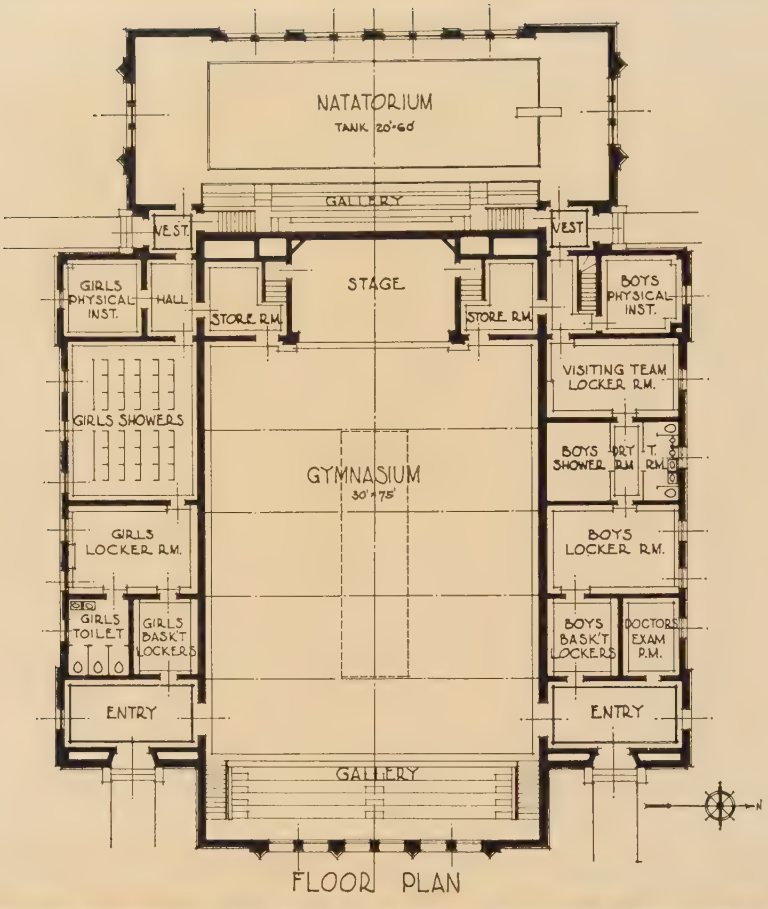


Interior of McCormick Gymnasium, University of Dubuque. For general plan of building see page 156.



Interior of Gymnasium, St. Joseph, Mich., High School. For general plan see page 79.

Exterior of Gymnasium Building, Alma College, Alma, Mich.



FLOOR PLAN

Gymnasium Building, Alma College, Alma, Mich., constructed in 1922 at a cost of $90,000.00, is an attractive and useful gymnasium for a small college. The natatorium section has not been constructed.

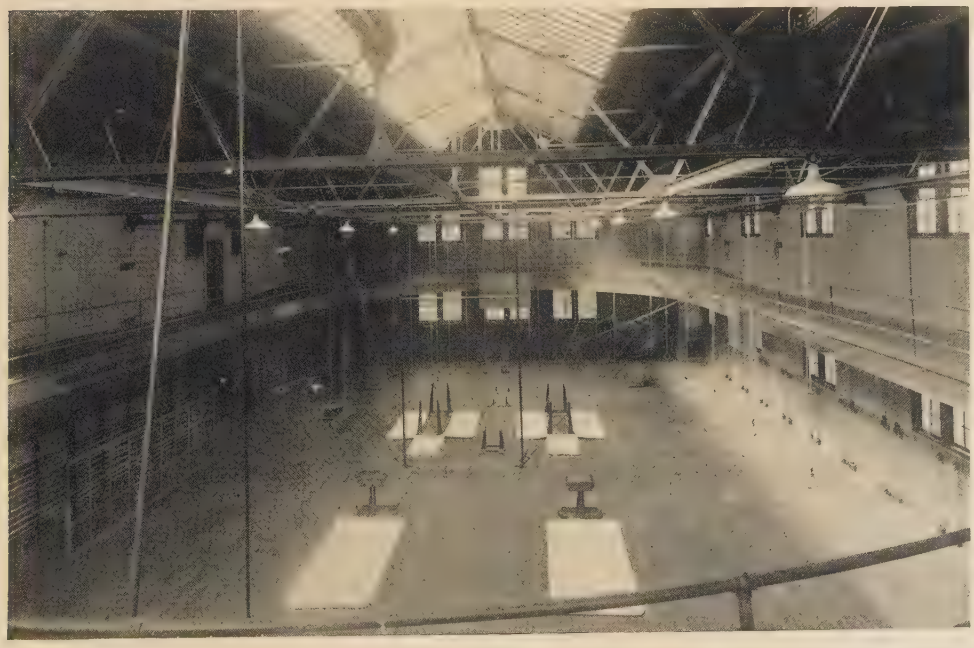
Interior of Gymnasium, David Worth Dennis Junior High School, Richmond, Ind. For general plan of building see page 54.

Interior of Gymnasium, Julia E. Test Junior High School, Richmond, Ind. For general plan of building see page 58.

Exterior of Gymnasium Section, Lincolnwood School, Evanston, Ill.

Interior of Gymnasium, Lincolnwood School, Evanston, Ill.

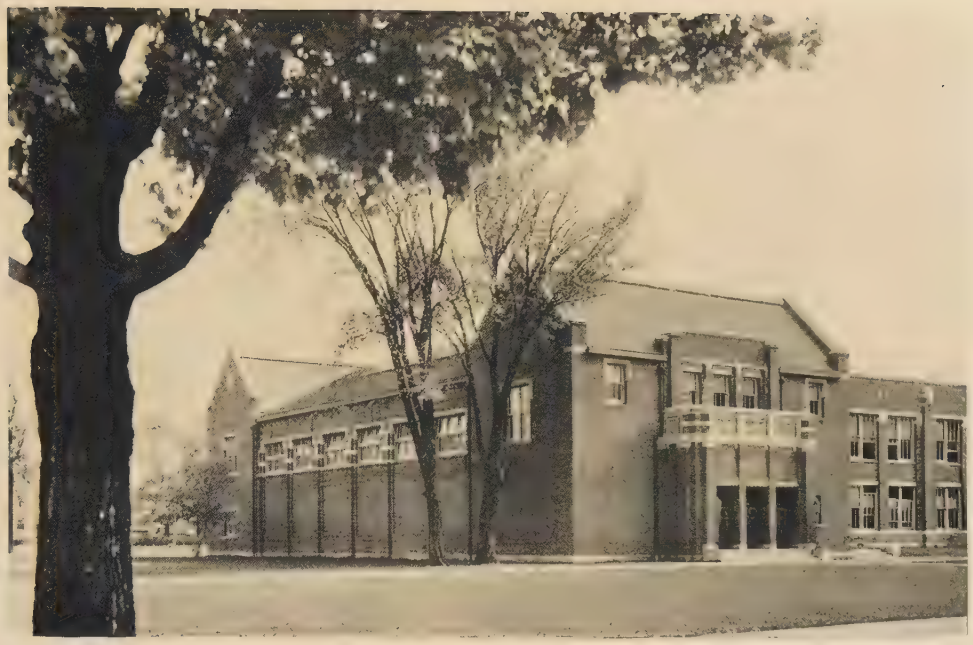
Interior of Boys' Gymnasium, New Trier Township High School, Kenilworth, Ill.
For general plan see page 82.



Interior of Gymnasium, Pontiac, Mich., High School. For plan of building see pages 85 and 86.

Interior of Gymnasium, Thomas L. Handy Junior High School, Bay City, Mich. For general plans of building see page 61. The playing floor is 50′ x 90′ and the gallery seats 600 people.

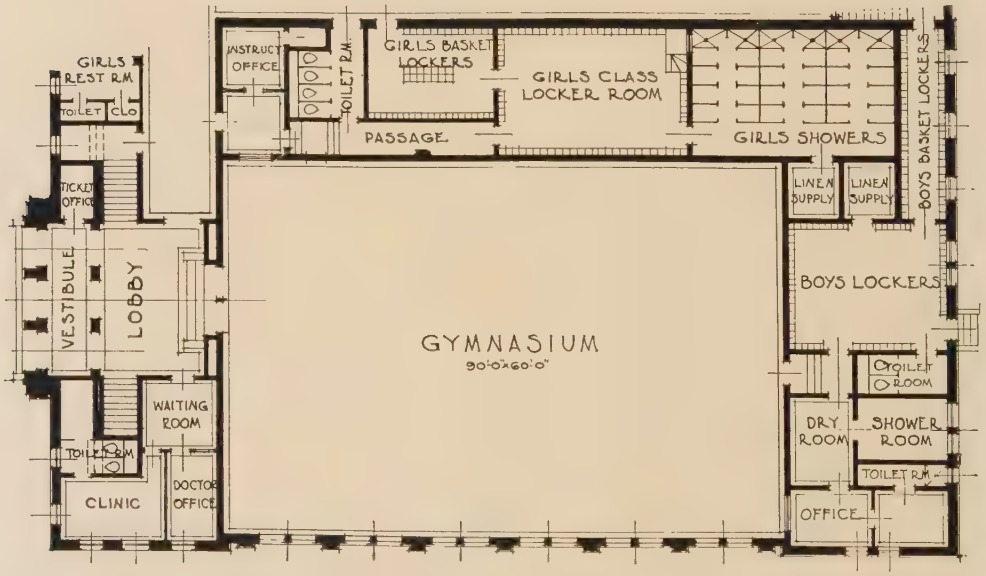
Exterior of Gymnasium Wing, Thomas L. Handy Junior High School, Bay City, Mich.



Exterior of Gymnasium Wing, Bay City, Mich., Senior High School. For plan see page 92.

Interior of Gymnasium, Bay City, Mich., Senior High School.

Exterior of Gymnasium Wing, Mishawaka, Ind., High School.



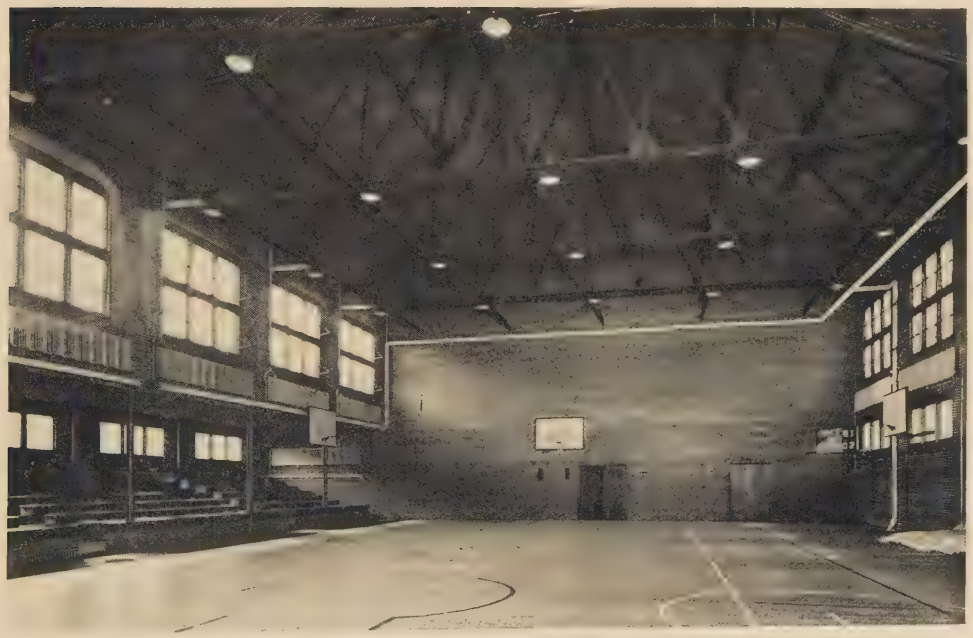
Plan of Gymnasium Wing, Mishawaka, Ind., High School. For general plan see page 112.

Interior of Gymnasium, Mishawaka, Ind., High School. A thousand spectators can be seated in the gallery.
For gallery plan see page 113.

Exterior of Gymnasium Wing, Manitowoc, Wis., High School.

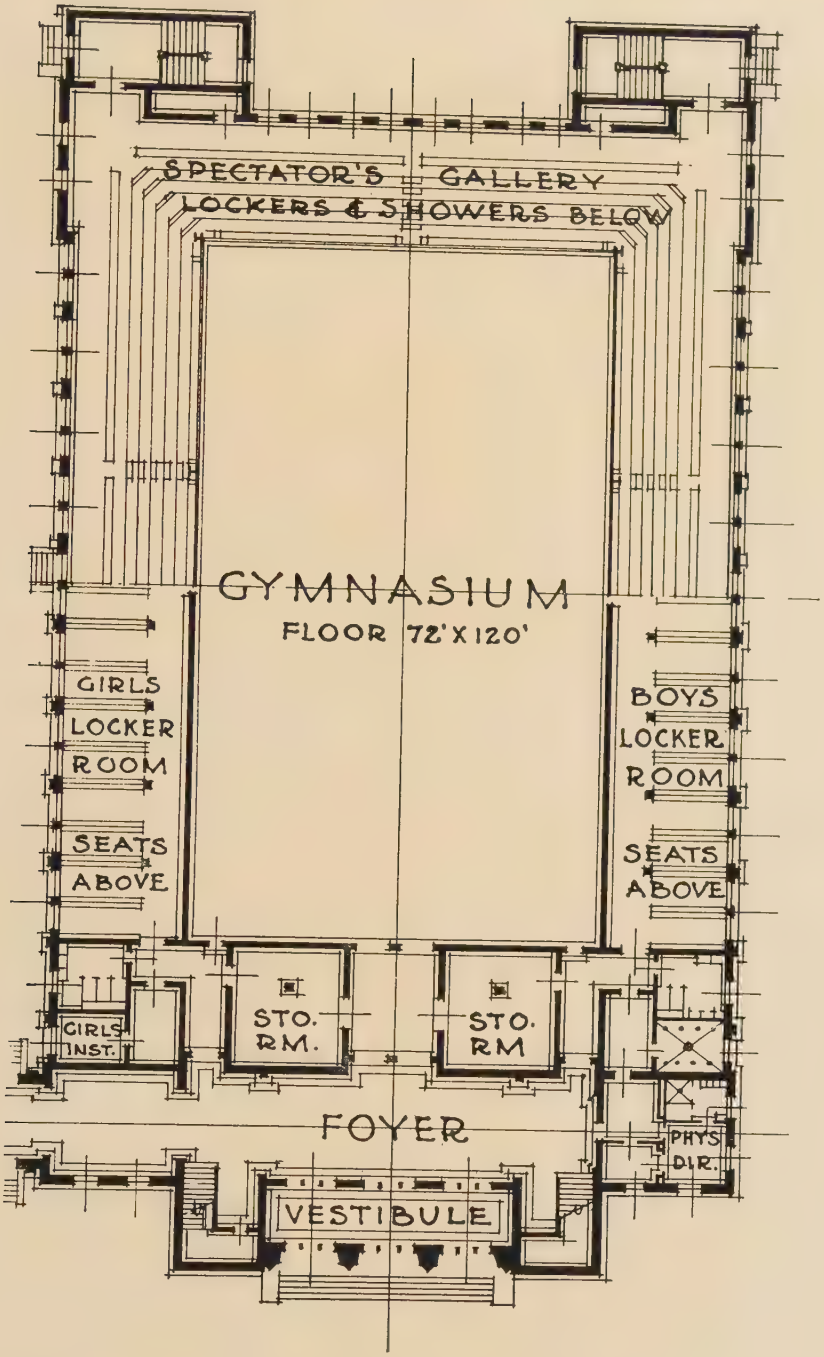
Interior of Gymnasium, Manitowoc, Wis., High School. For plans see pages 104 and 105.

Interior of Gymnasium, St. Clair, Mich., High School. For general plan see page 97.



Interior of Gymnasium, Niles, Mich., High School. For general plan see page 100.

The Gymnasium Wing of the Evanston, Ill., Township High School, above illustrated, is designed in the Gothic style in conformity with the character of the Academic Building. The playing floor is sufficiently large to provide for three practice ball courts used at one time and separated by high nets. The visitors' gallery has a normal capacity of 1,800, with ample and well lighted rooms for lockers, toilets, and shower baths provided below the galleries. The Gymnasium will be used as an Assembly Hall pending the construction of the permanent Auditorium for the Evanston High School. A Girls' Gymnasium and Natatoriums will be later added to this section of the building. For general plan see page 121.

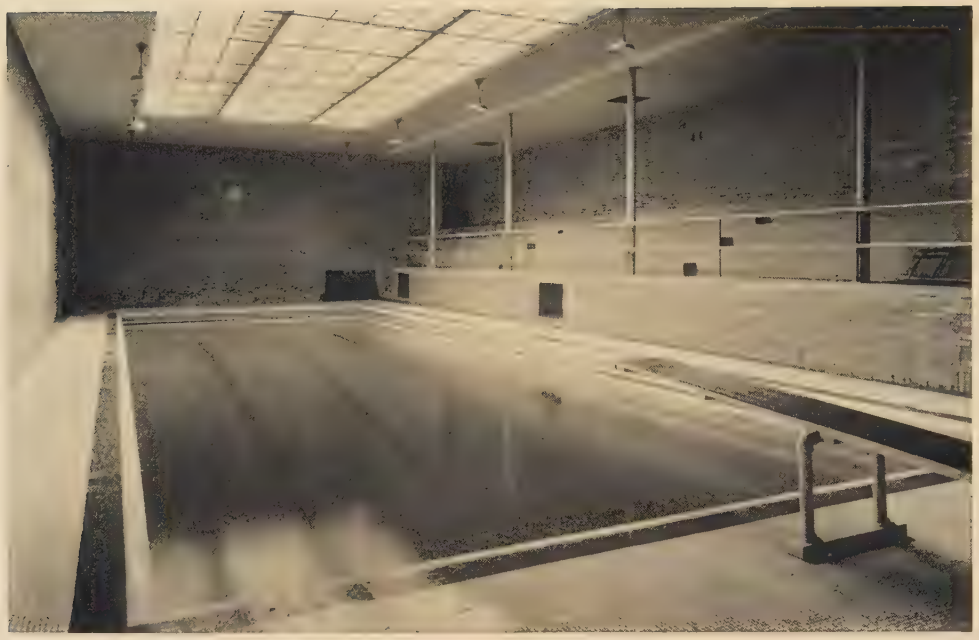


Plan of the Gymnasium Wing as built in 1924, Evanston, Ill., Township High School. This building with the passage connecting it and the main or Academic Building was constructed at a cost of $313,300.00; it contains 924,000 cubic feet and its cost per cubic foot was 33.9.

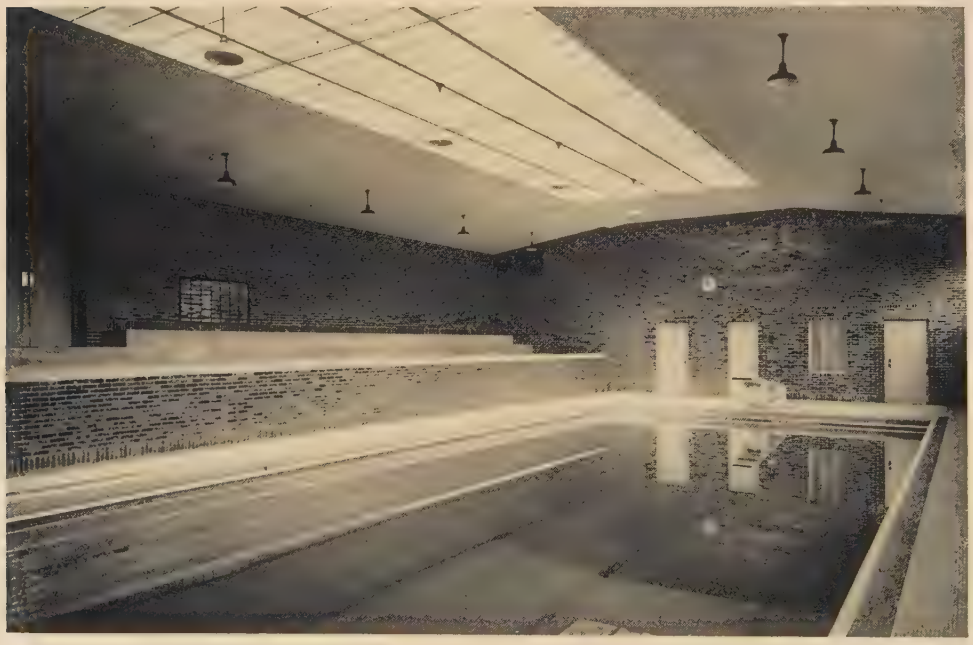
Interior of Gymnasium from the Gallery, Evanston Township High School.

The Natatorium, New Trier Township High School, Kenilworth, Ill.

Natatorium, McCormick Gymnasium Building, University of Dubuque, Iowa.



Natatorium, Thomas L. Handy Junior High School, Bay City, Mich.



Natatorium, Bay City, Mich., Senior High School.

SECTION VII

Assembly Halls and Auditoriums

Illustrating

Jane Kuppenheimer Auditorium, Skokie School, Winnetka, Ill.
Auditorium, Bay City, Mich., Senior High School.
Auditorium, Thomas L. Handy Junior High School, Bay City, Mich.
Auditorium, David Worth Dennis Junior High School, Richmond, Ind.
Auditorium, Lincoln High School, Manitowoc, Wis.
Auditorium, New Trier Township High School, Kenilworth, Ill.
Auditorium, Pontiac, Mich., High School.
Assembly Hall, Lincolnwood School, Evanston, Ill.
Assembly Hall, St. Joseph, Mich., High School.
Assembly Hall, Hubbard Woods School, Winnetka, Ill.
Assembly Hall, Roosevelt School, River Forest, Ill.
Assembly Hall, Oakton School, Evanston, Ill.

Designed by
PERKINS, FELLOWS AND HAMILTON
Architects, Chicago

Assembly Halls and Auditoriums

THE constantly increasing interest in the study and development of dramatic art, as an essential part of popular education, together with the increased use of school auditoriums for purposes of general assembly outside of school hours, has resulted in an evolution from the second or third story assembly room of twenty-five years ago—with its level floor and small platform stage—to the present day large and spacious high school auditorium conforming in plan and arrangement with modern theatre design. It is in reference to these rooms that the present day state laws and city ordinances are most exacting in their provisions.

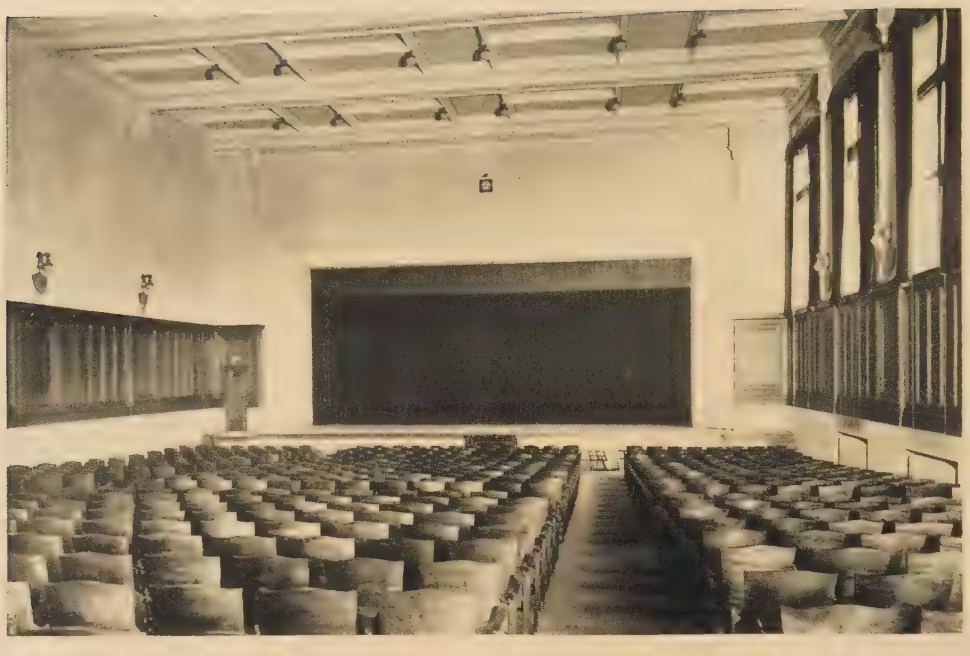
While a few years ago these assembly halls were quite commonly placed in the upper stories of school buildings, it is a rare instance now when they are placed more than a few steps above the ground level. Such rooms, in the large senior and junior high schools have main floor seating capacity of 500 to 1,000 with inclined floor, and are seated with opera chairs. In the elementary schools of smaller size, level floors and movable chairs are generally provided. In all of them, projector rooms for moving picture machines are provided.

A few of the larger high school auditoriums have stages equipped with gridirons and scene lofts. The majority of them use simple scenery, mostly of panels standing on the floor or cloth draperies of various colors hung from cycloramic frames.

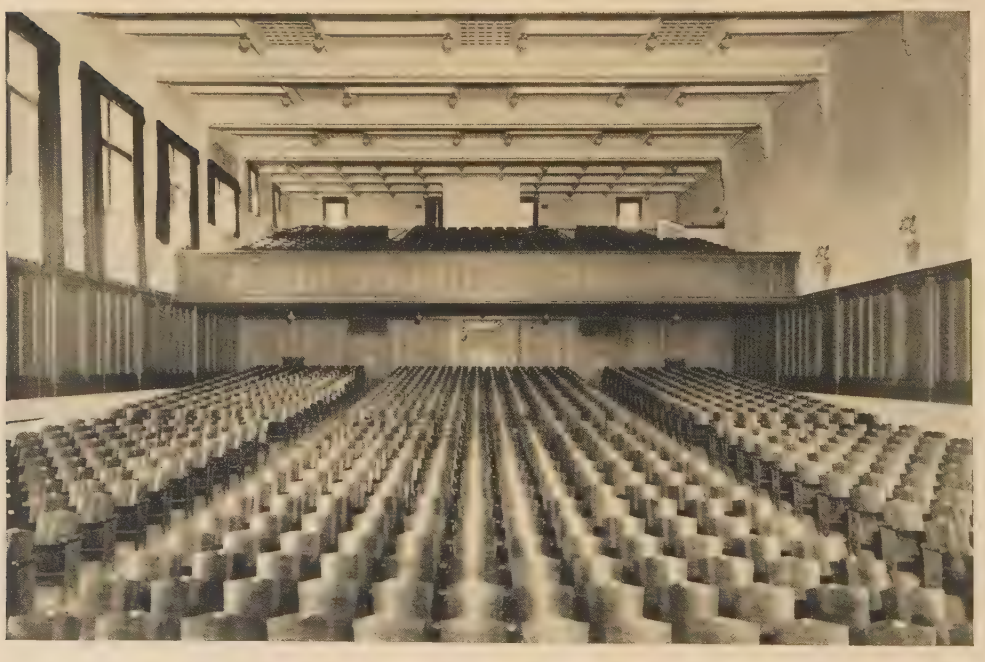
A complete system of stage illumination with electrical control from the stage as well as from the projector room is a normal requirement. In most of the larger auditoriums, the mushroom system of ventilation, introducing warm fresh air under the seats and removing it from the grilles at or near the ceiling, prevails.

The Jane Kuppenheimer Auditorium at the Skokie School, Winnetka, Ill., is a beautiful room, donated by Mr. Louis B. Kuppenheimer in memory of his daughter. Its seating capacity, including gallery, is 1,140. The stage adjoins and is on the same level with the Gymnasium, from which it can be separated by large folding doors or into which it may be completely opened for increasing the depth of the stage or for viewing gymnastic exhibitions in the Gymnasium from the Auditorium. For general plan of building see page 37.

View of Jane Kuppenheimer Auditorium, Skokie School, Winnetka. Ill., looking toward gallery. The gallery may be closed off from the Assembly Hall for use as a music room, by a series of sliding doors provided for the purpose.



Assembly Hall, Bay City Senior High School, looking toward stage.



Assembly Hall, looking toward gallery, Bay City Senior High School, Bay City, Mich. For general plan see page 93.

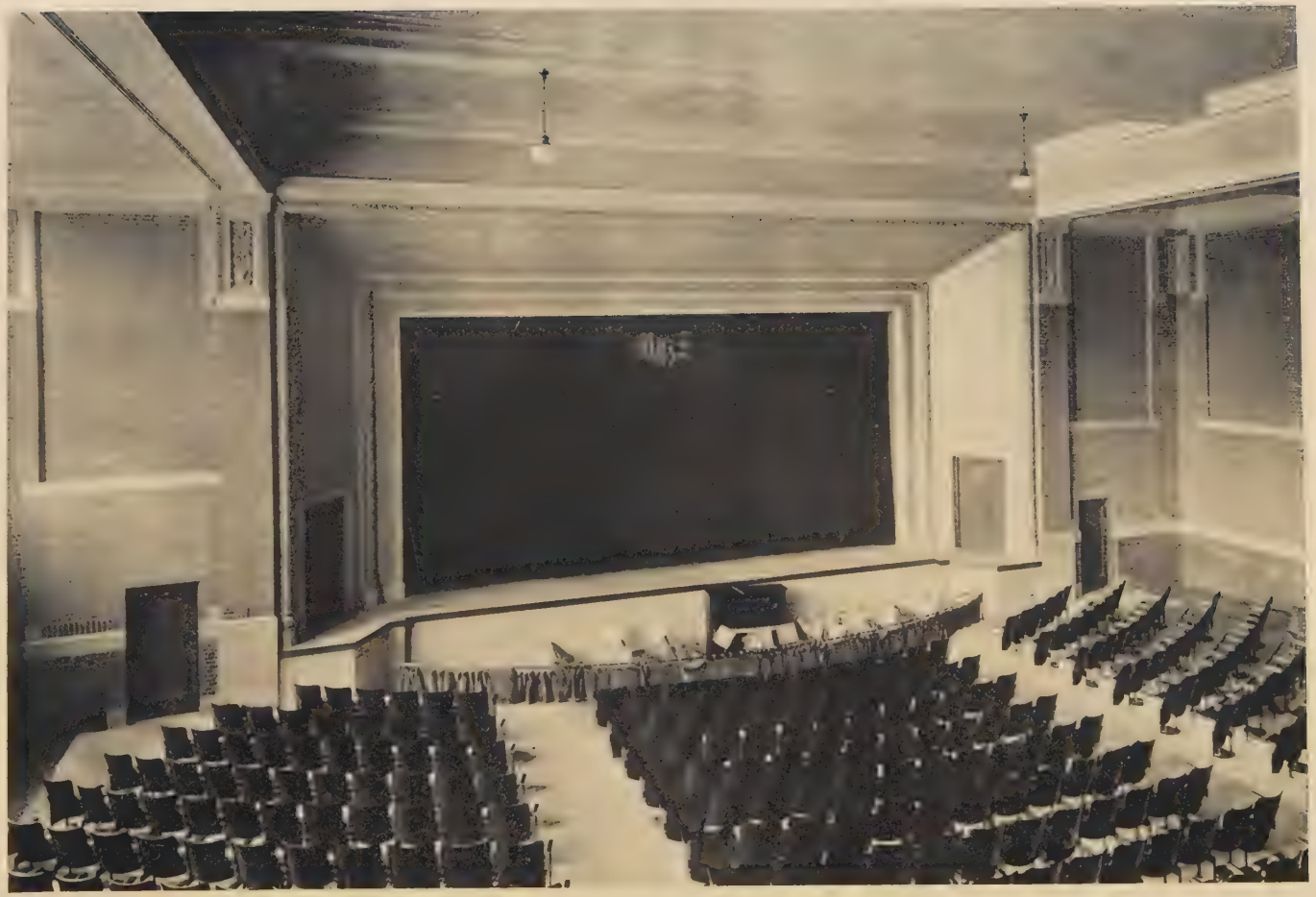
Interior of Auditorium, looking toward stage, Thomas L. Handy Junior High School, Bay City, Mich. The seating capacity of this room is about 800. For plan see page 61.

Interior of Auditorium, looking toward stage, David Worth Dennis High School, Richmond, Ind. The seating capacity of this room is about 700. For general plan see page 54.

Interior of Auditorium, Manitowoc, Wis., High School. The seating capacity of this room is about 1,200. For general plan see page 104.

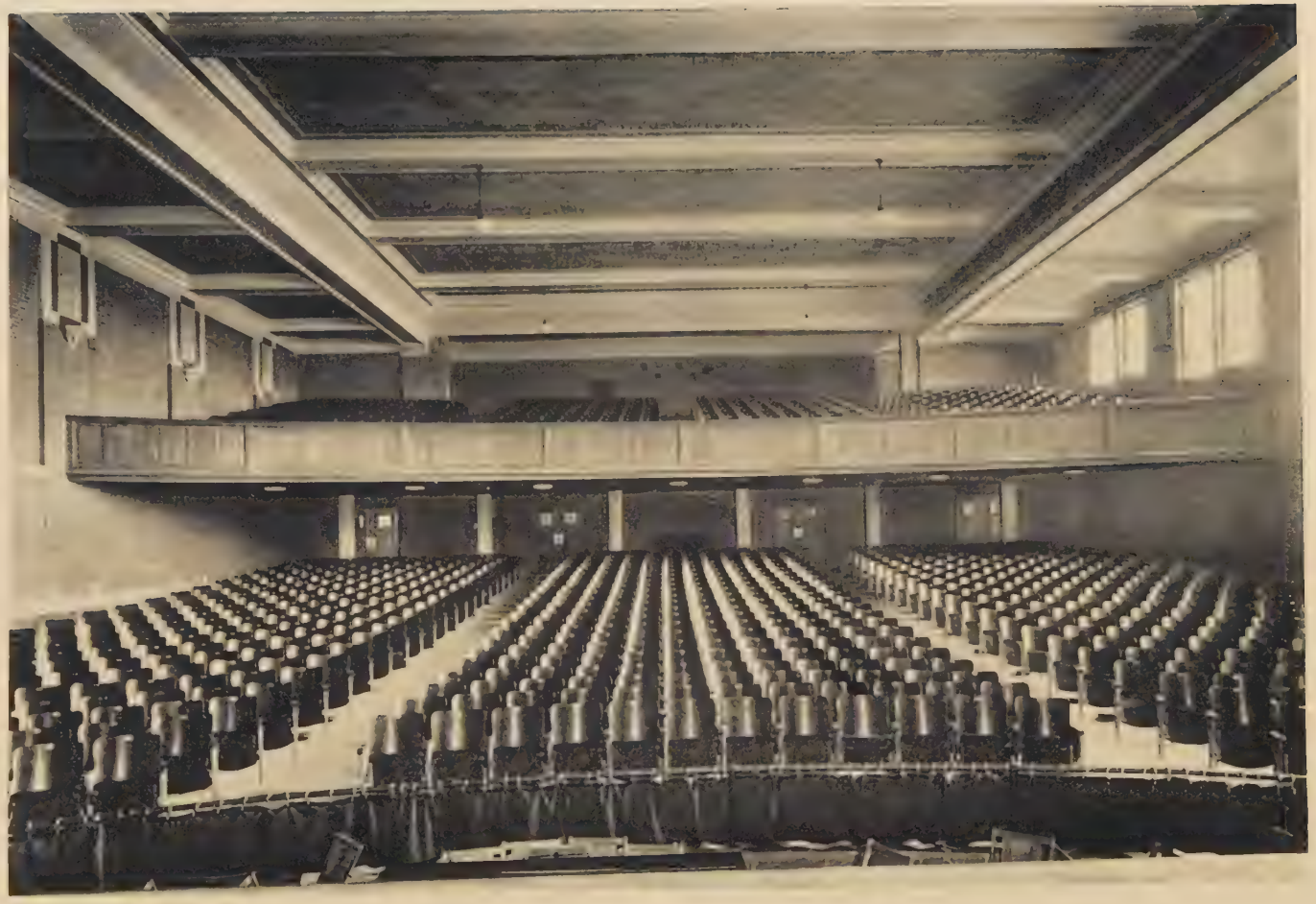
The high banked floor with tunnel exits of the Manitowoc, Wis., High School Auditorium is here illustrated.

Exterior of Auditorium Wing, Mishawaka, Ind., High School.



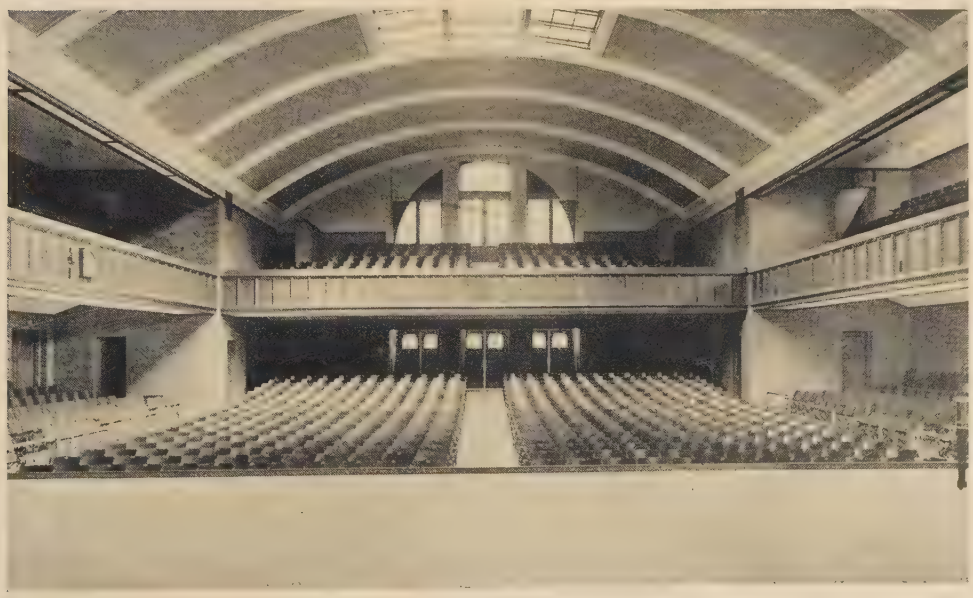
Interior of Auditorium, Mishawaka, Ind., High School, looking toward the stage. The doors in either side of the proscenium arch are a great convenience for a high school stage, providing entrance upon the stage in front of the curtain without passing through the curtain or over the apron.

Interior of Auditorium, Mishawaka, Ind., High School, showing the decorative brick treatment of walls, curved front of cantilever balcony and acoustical treatment of ceiling.



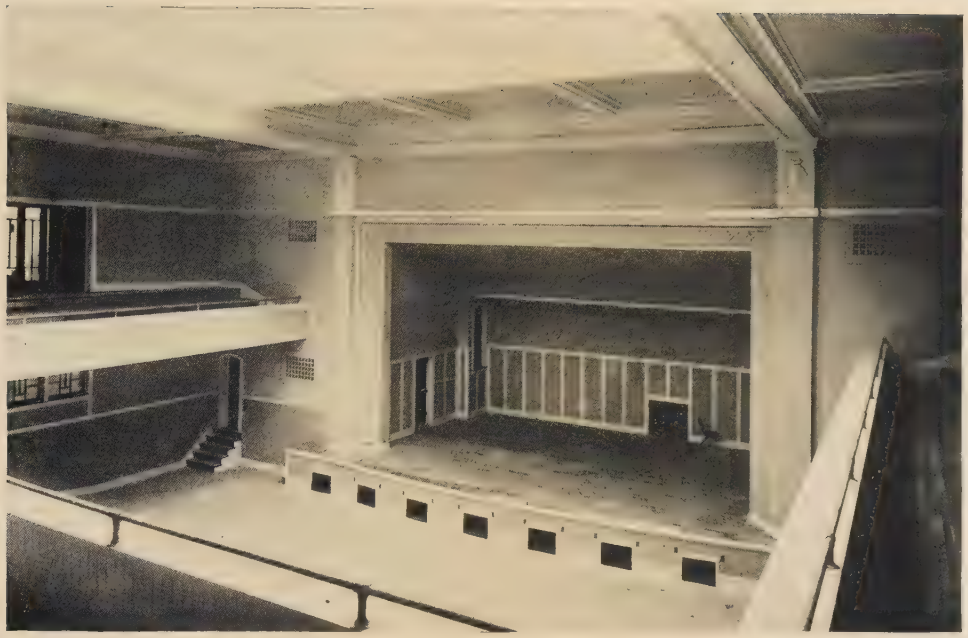
Interior of Mishawaka, Ind., High School Auditorium, looking toward the rear of the house from the stage.
For plan of building see page 112.

View toward stage showing folding side sections to provide for enlargement of proscenium opening.

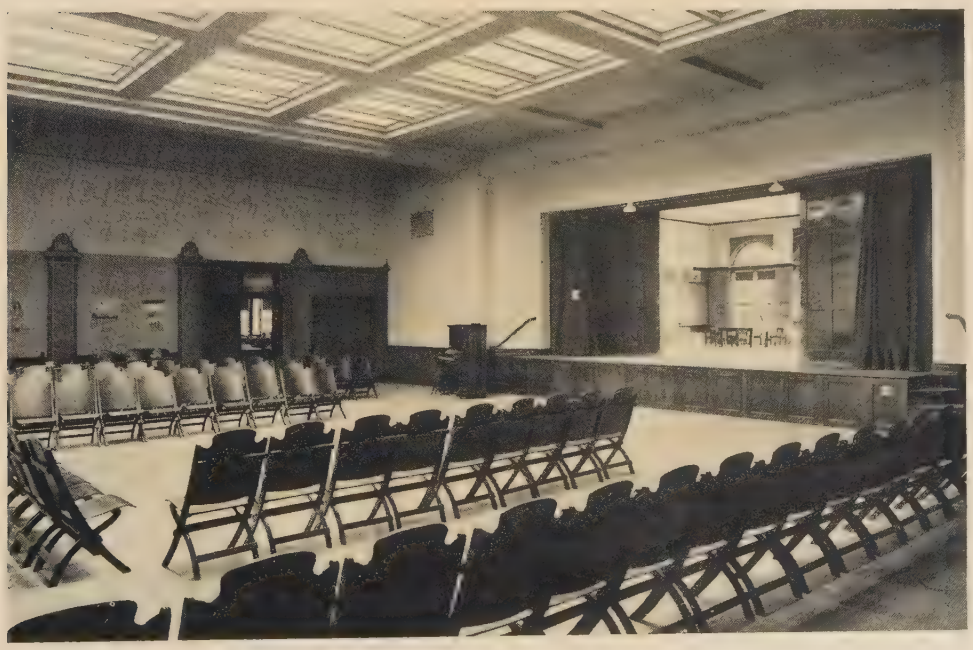


View from stage toward galleries, Auditorium, New Trier Township High School, Kenilworth, Ill.

Interior of Assembly Hall, Lincolnwood School, Evanston, showing kindergarten stage and room in use for dancing instruction. For general plan of building see page 19.



Interior of Auditorium, St. Joseph, Mich., High School. For general plans see pages 79 and 80.



Interior of Assembly Hall, Hubbard Woods School, Winnetka, Ill., showing kindergarten stage. For general plan see page 25.

Interior of Gymnasium-Assembly Hall, Roosevelt School, River Forest, Ill. For general plan of building see page 42.

Interior of Assembly Hall, Oakton School, Evanston, Ill., with kindergarten stage. For general plan see page 21.

SECTION VIII

Dining Halls and Cafeterias for Public and Educational Buildings

Illustrating

Refectory, Lincoln Park, Chicago, Ill.

Dining Hall, Wartburg Seminary, Dubuque, Iowa

Mess Hall, New Trier Township High School, Kenilworth, Ill.

Lunch Room, Lincoln High School, Manitowoc, Wisconsin

Temporary Mess Hall, Evanston Township High School, Evanston, Ill.

Lunch Room, Mishawaka, Ind., High School

Lunch Room, Niles, Mich., High School

Designed by

PERKINS, FELLOWS AND HAMILTON

Architects, Chicago

Dining Halls and Cafeterias

ALTHOUGH the dining halls herein illustrated vary in both form, size and purpose they are, nevertheless, of one class in that they are parts of institutions for service and not for profit.

The Refectory is a park restaurant operated under a concession granted by the Commissioners of Lincoln Park. Its balconies and terraces have a beautiful prospect overlooking the lagoon and about three hundred people can be served at one time.

The Wartburg dining hall and Peters Commons at University of Dubuque are dining halls of smaller size for the regular use of students and faculty residing at these institutions. Each of them is served from a modern mechanically equipped kitchen. Peters Commons also has a cafeteria room with a capacity of about 100.

An influence of important educational and social value has been created in the high schools by the development in recent years of the lunch period. The tin lunch box with its cold contents carefully packed by mother, and possibly reinforced with a bowl of hot soup, has been largely done away with in the great high schools where food is mechanically prepared and served to almost the entire student body. The old type of crowded, uninviting basement lunchroom, with its noise and confusion, is being replaced by dining halls which rival in beauty and order the Commons of the great colleges.

New Trier Township High School at Kenilworth, Illinois, is one of those large and prominent institutions for secondary education in the populous and rapidly growing suburbs of Chicago, outside of the city but within Cook County.

The facts that a large proportion of the pupils live too far from the school to go home for lunch, and that the degree of economy which still demands the lunch box is not general among the families of New Trier Township, are largely responsible for the unusual development of the mess hall system as found in this institution. One thousand of the 1,400 pupils buy and eat their luncheons regularly, which makes it possible to maintain a fully organized and economical service for the purpose.

The mess halls are on the ground floor level and immediately adjoin and are connected with the school auditorium. The interiors of all of these rooms are of brick of a decorative character. The serving room is self-contained and can be closed off from the mess halls by rolling partitions in the eight large openings, making the rooms suitable for dances and other social uses. In the serving room are four independent food serving tables, each having a capacity of 250 in twenty minutes. The pupils approach the serving room down the center aisle of the combined halls and then divide into four lines, passing to the dining tables without confusion or crossing of lines of travel.

The faculty dining room is above the serving room and opens onto balconies overlooking the

students' mess halls. A separate cafeteria service is provided for it with electric dumbwaiter connections to the main kitchen and a smaller kitchen for independent use on occasions. A separate bakery, a refrigerator room, and a food supply room adjoin the kitchen. Large store rooms served by a freight elevator are in the basement. Mechanical refrigeration is employed exclusively.

The community aspect of the whole plan is apparent from a study of the drawings. The entire auditorium can be filled and after entertainment there the whole assembly can be fed. After the meal is over, the rolling shutters can be lowered, excluding the serving room with its noise. In the same manner, daytime use of the lunchroom for other purposes is made possible by shutting off the serving room.

The temporary mess hall at Evanston High School corresponds in function, capacity and equipment to that at New Trier High School but the whole is housed in a temporary wood structure.

The lunch rooms at the Manitowoc, Mishawaka and Niles High Schools are more typical of average conditions where a large proportion of pupils go home for lunch or bring their lunch with them.

The mess halls at New Trier and Mishawaka High Schools are used for high school dancing parties as well and are occasionally rented to neighborhood groups for evening parties, suppers, etc.

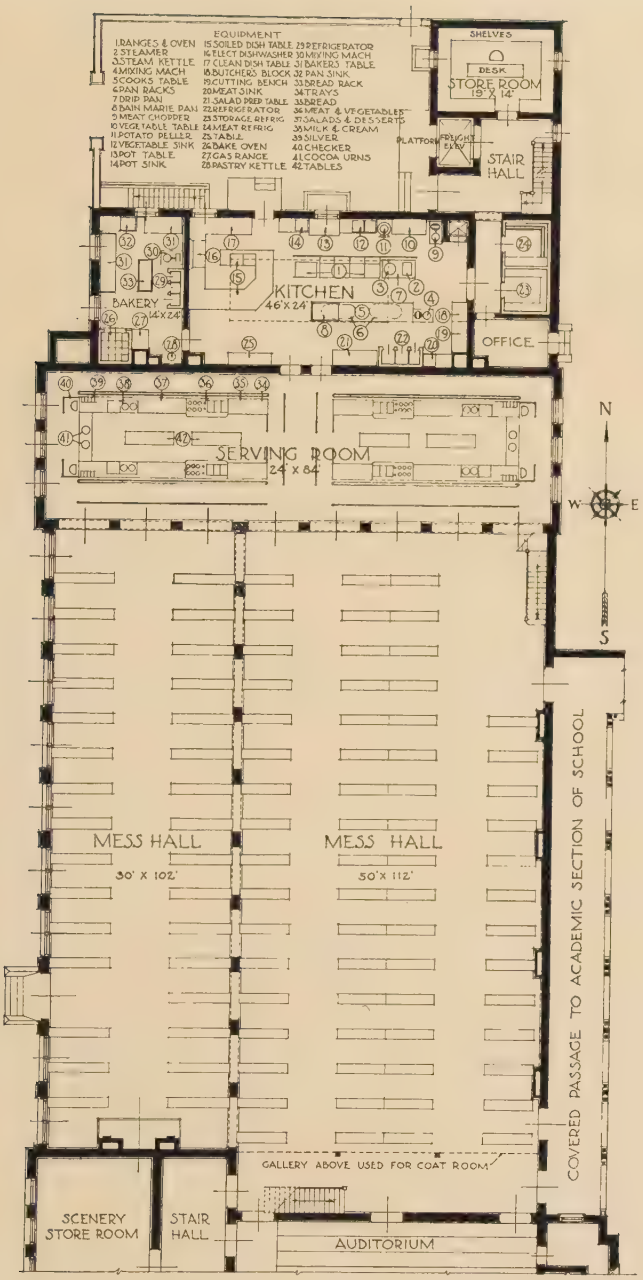
The Main Dining Hall in the Refectory Building in Lincoln Park, Chicago, is an elongated octagon in form with an interior wall treatment of buff speckled brick laid in decorative design and trimmed with dull enameled terra cotta of a gray-green color. The decorative panels and back wall of soda fountain are of faience tile by the Rockwood Potteries. For plans of building see page 164.

The Commons in Wartburg Seminary, Dubuque, Iowa, balances the Chapel in the plan (see page 138) and has a character expressing its purpose.

Faculty Dining Room, New Trier Township High School, Kenilworth, Ill. This room seats 100 and opens onto a gallery overlooking the Students' Mess Hall.

Cafeteria, Lincoln High School, Manitowoc, Wis.

Interior of Students' Mess Hall, New Trier Township High School, Kenilworth, Ill. The stairs and gallery leading to the Faculty Dining Room are seen at the far end of the room.



The Students' Mess Halls, New Trier Township High School, Kenilworth, Ill.

Interior of Kitchen to Students' Mess Halls, New Trier Township High School, Kenilworth, Ill.

Interior of Serving Room to Students' Mess Halls, New Trier Township High School, Kenilworth, Ill.

Interior of Temporary Mess Hall, Evanston, Ill., Township High School.

Interior of Lunch Room Kitchen, Mishawaka, High School.

Interior of Lunch Room, Mishawaka, Ind., High School.

SECTION IX

Heating and Ventilating Plants for Educational Buildings

Illustrating

Heating Plant, Bay City, Mich., Senior High School

Heating Plant, Thomas L. Handy Junior High School, Bay City, Mich.

Heating Plant, Lincoln School, Manitowoc, Wis.

Heating Plant, Mishawaka, Ind., High School

Heating Plant, Evanston, Ill., Township High School

Heating Plant, Julia E. Test Junior High School, Richmond, Ind.

Heating Plant. Roosevelt Junior High School, Appleton, Wis.

Designed by

PERKINS, FELLOWS AND HAMILTON

Architects, Chicago

Heating and Ventilating Plants

THE designing of heating and ventilating plants in educational institutions is one of the most important and one of the most complicated elements contained in the service of the architect.

The primal requisite in this connection is that the design of the building and its heating and ventilating systems be conceived and developed concurrently and with the designers of both in full cooperation.

Engineering practice in the designing of this equipment has been much standardized by state laws and city ordinances and the tendency of development seems to be constantly toward greater cost and elaboration.

The average cost of heating and ventilating plants in the public schools exclusive of the cost of masonry construction necessary to house the apparatus is about 14 per cent of the total cost of the building with the minimum for mechanically ventilated buildings at about 12 per cent and the maximum as high as 18 per cent.

Although engineering standards employed in the design of these systems are well established and represent a vast amount of scientific research and experimentation, the educational and health authorities are not as yet fully convinced of the superiority of mechanical ventilation over the simpler forms of "natural" ventilation, through open windows and through gravity circulation of air.

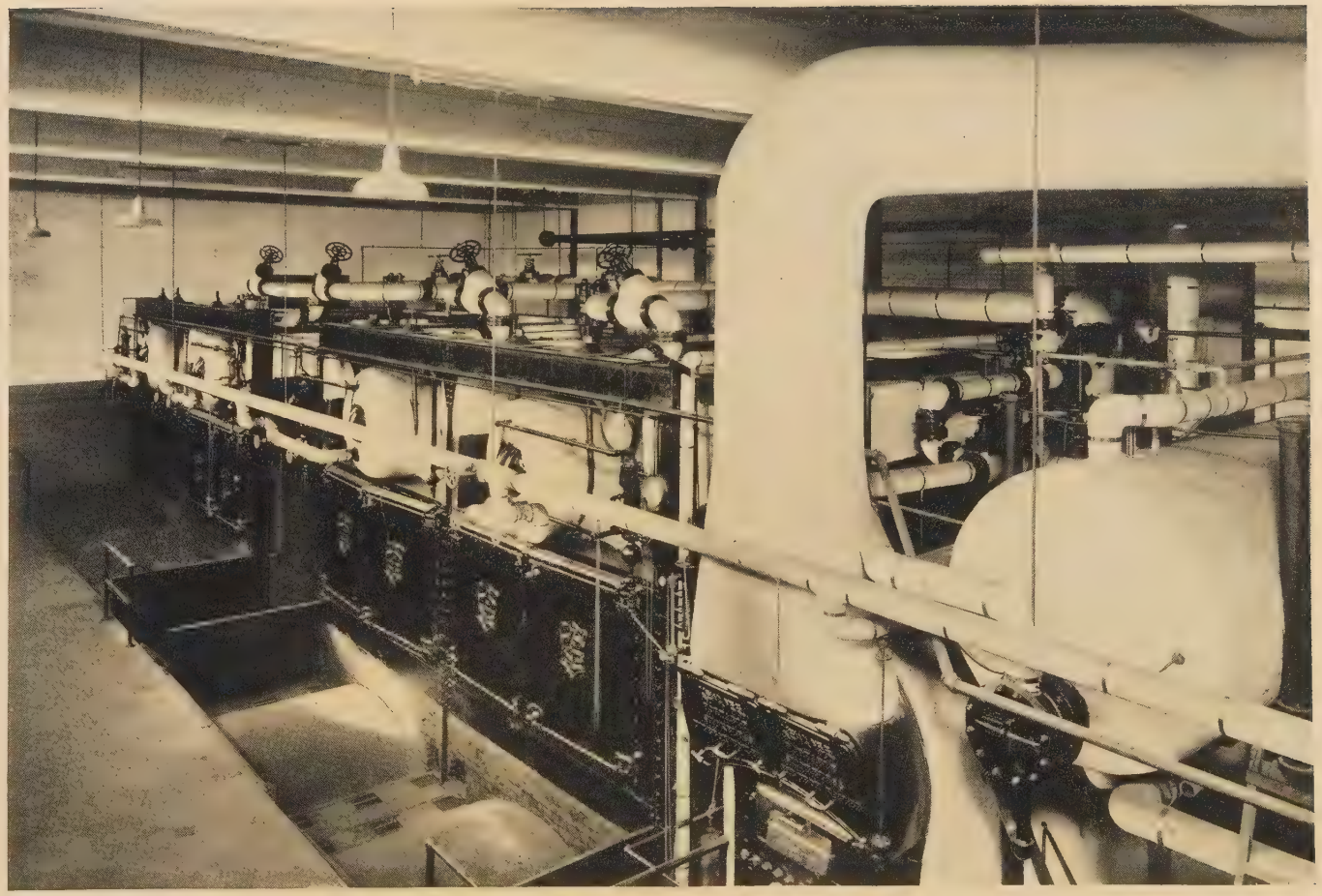
It cannot be denied that the expense of oper-

ating the modern type of mechanical plant and the difficulty of obtaining competent operating engineers constitutes a continuous and annoying problem to the educator and the non-use of much expensive apparatus. It is only in institutions where these plants are designed and operated with full knowledge of the subject that satisfactory results can be attained.

The heart of such a system is in the boiler plant which must be designed for efficient operation, freedom of menace to the building and occupants from fire and smoke, accessibility for fuel delivery and cinder disposal, economical distribution of steam and architecturally satisfactory position of boiler and coal rooms and chimney stack. Frequently for large institutions these conditions are best met by an isolated boiler plant which often serves a whole group of buildings.

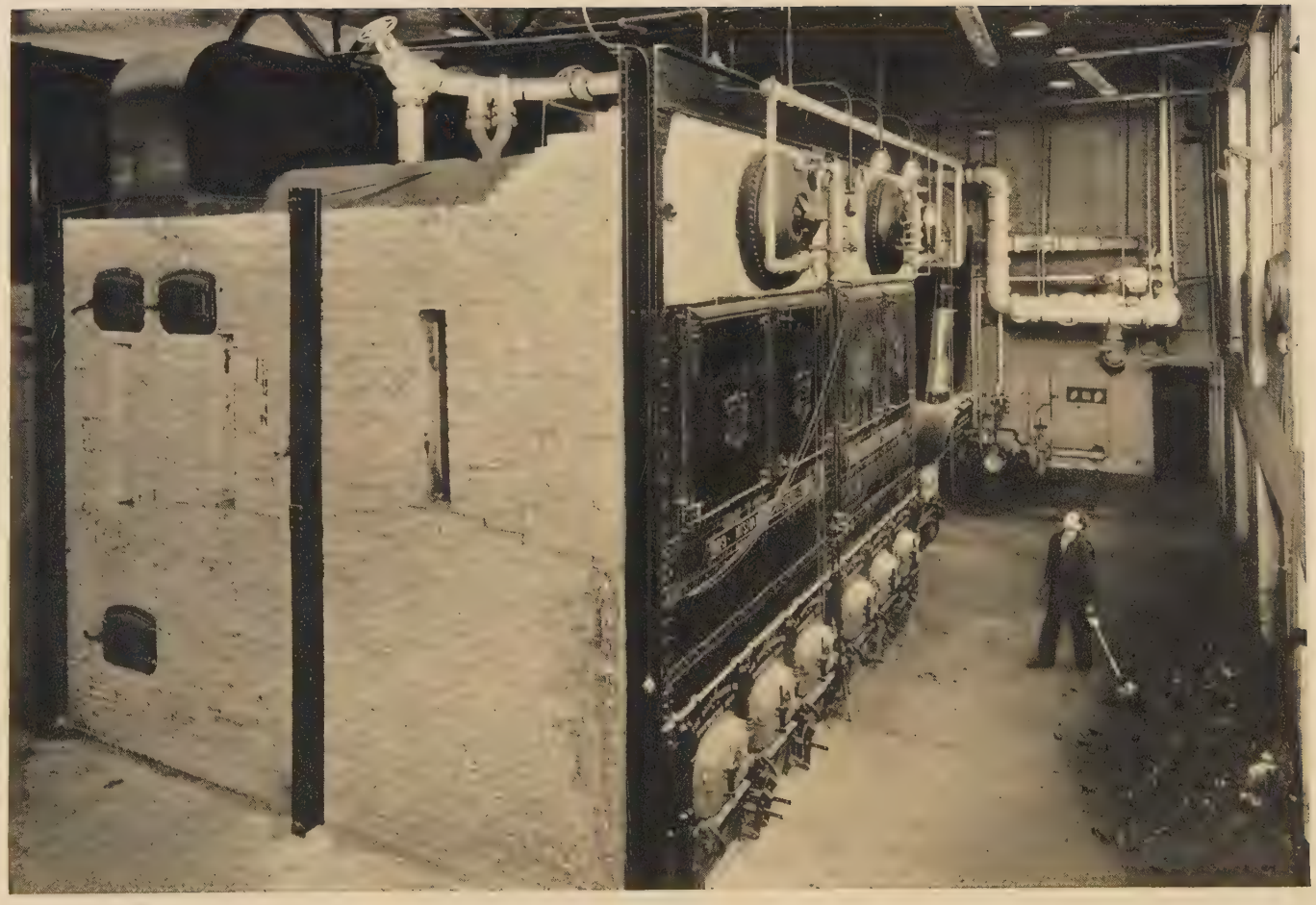
The concentration of mechanical ventilating systems in large blower units often driven by steam engines and with very long distributing ducts has gradually given way with the advance of electric power to smaller motor driven units serving sections or departmental portions of the buildings and in some buildings to still smaller units placed in each room.

Recirculation and purification of warmed air as a means of saving fuel and plant construction cost is a recent departure and the results of plants so operated are being closely observed.

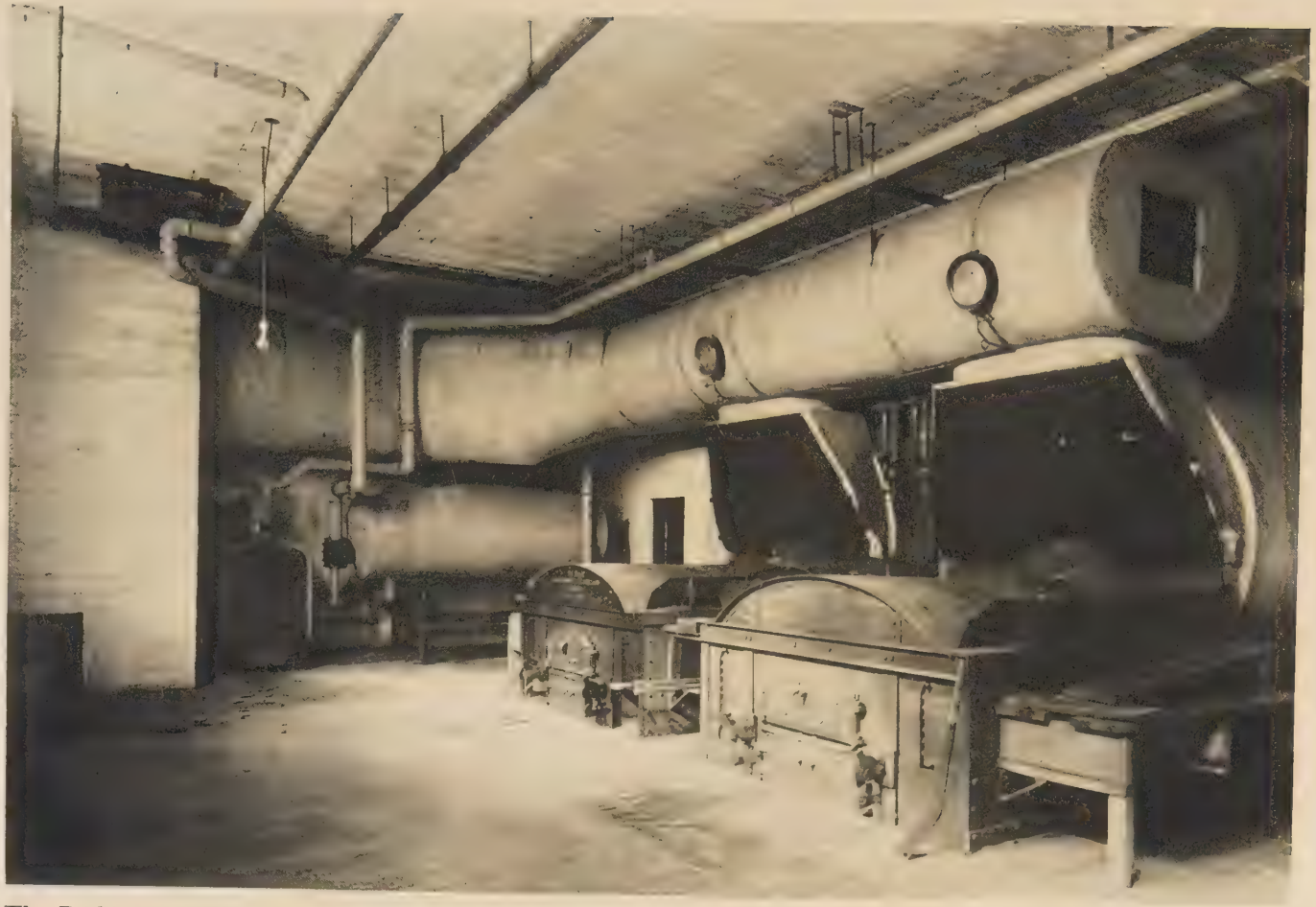


Boiler Plant, Bay City, Mich., High School. Four main boilers of water tube type. Over-feed stoker system with firing floor. The small portable type firebox boiler is for auxiliary use during holidays and vacations.

Boiler Plant, Thomas L. Handy Junior High School, Bay City, Mich. Return Tubular Boilers, hand fired.



The Boiler Plant at the Mishawaka, Ind., High School is composed of two water-tube units of 250 H. P. each, with a small auxiliary portable fire-box boiler. Space for a third large unit is provided.



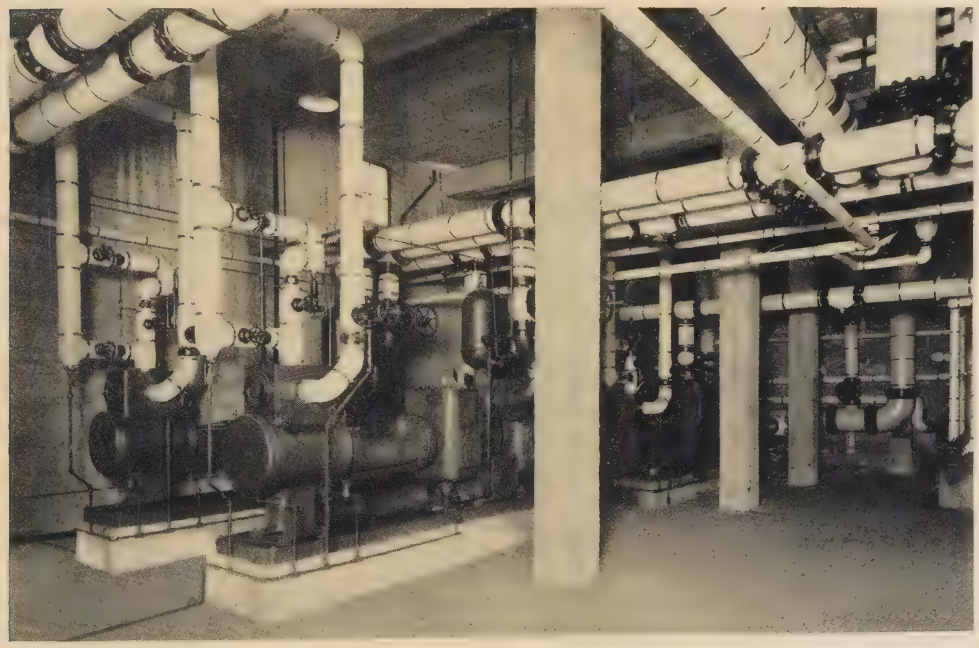
The Boiler Plant at the St. Clair, Mich., High School consists of two Scotch Marine Boilers with Dutch Ovens. Space is provided for a future third unit. This type of boiler is well adapted where space is limited in height but ample from front to back.

Boiler Plant in isolated boiler house, Manitowoc, Wis., High School.

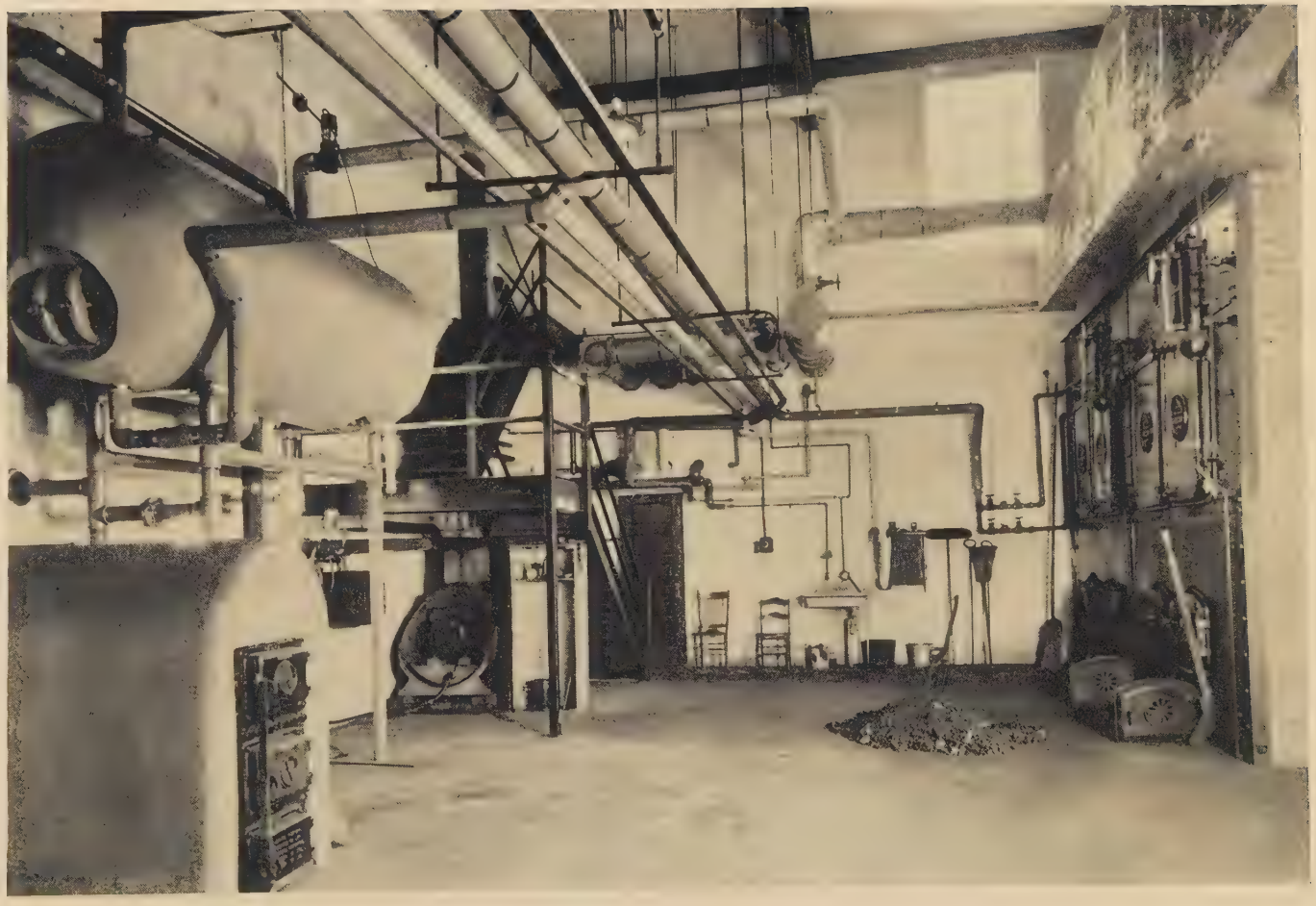
Boiler House, Evanston, Ill., Township High School. A mechanically operated plant complying with all engineering demands and clothed with an architectural exterior. Neiler, Rich & Co. were Consulting Engineers.

The boilers for heating the Evanston High School are of water-tube type, 714 horse power each, and equipped with automatic chain grate stokers fed from elevated coal hoppers.

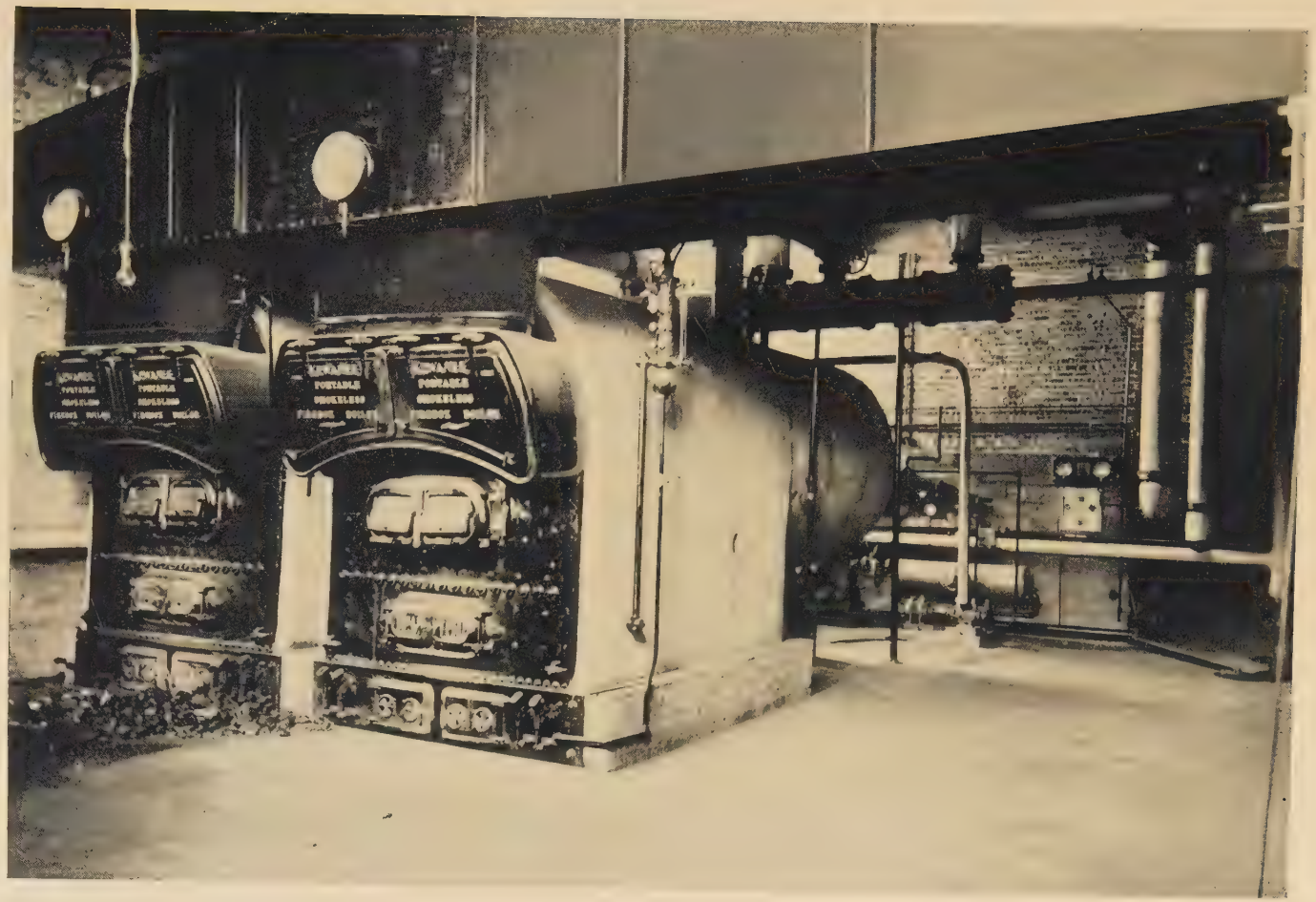
View of conveyor floor, looking into coal hoppers, Boiler House, Evanston Township High School.



The pump room in Boiler House, Evanston Township High School.



View of Boiler Plant in isolated boiler house, Julia E. Test Junior High School, Richmond, Ind.



View of Boiler Plant, Roosevelt Junior High School, Appleton, Wis., showing portable type fire-box boiler installation.

SECTION X

Reconstruction of Old Buildings for Educational Purposes

Illustrating

Cadillac, Mich., High School

Whitewater School, Richmond, Ind.

Designed by

PERKINS, FELLOWS AND HAMILTON

Architects, Chicago

Reconstruction of Old Buildings

AMONG the most vexing problems confronting school and college authorities is the disposition by reconstruction or replacement of old and obsolete buildings. Most of such buildings represent the errors of the past, some of which errors were due to lack of vision, some to lack of experience, some to lack of artistic sense or proper appreciation of orderly design and good construction; while some of these errors appear to us to be due to sheer ignorance.

We in the middle west have as yet few buildings which are good enough and old enough to be revered. In fact, we have been in some instances justly charged with destroying valuable buildings of real merit and historic associations.

Among the older structures built for schools and colleges many undoubtedly must be destroyed and entirely replaced by new buildings, some due to poor condition of structure, some to irremediable defects in design and some to locations on the site which cannot be harmonized with new conditions. There are, however, some buildings of this character which were planned with good though inartistic judgment and substantially constructed and are capable of utilization to an extent of 25 per cent to 75 per cent of their replacement cost. An examination of such buildings usually discloses complete obsolescence of heating, ventilating, plumbing and electrical installations, wood floor, roof and stair construction, and corner class

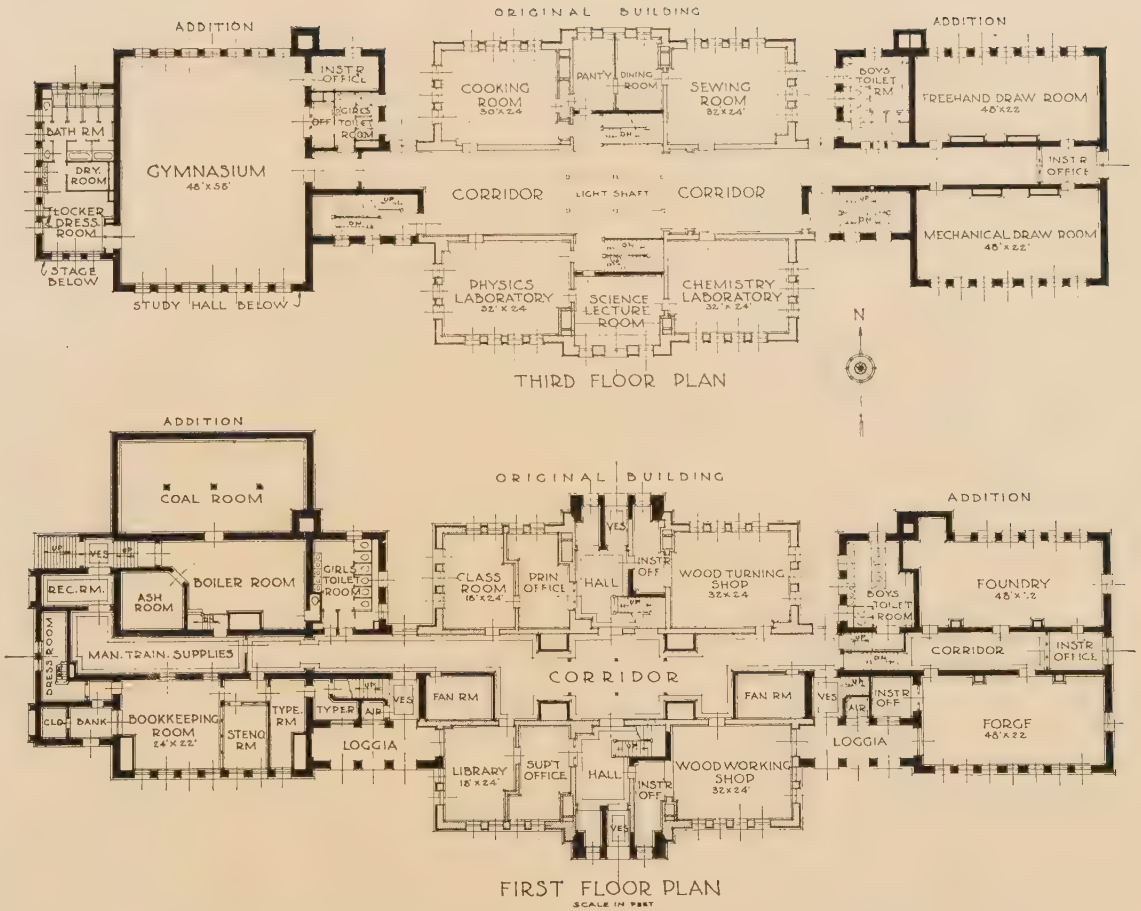
rooms inadequately lighted from windows on two sides.

Two interesting examples of the utilization of such structures are the Cadillac, Michigan, High School and the Whitewater School at Richmond, Indiana. In both cases nothing was allowed to remain of the old structure but sound masonry wall construction and substantial wood joist constructed floors. Fireproof corridor floors and stairs replaced the old ones of wood construction and all exposed surfaces both inside and outside of the buildings were re-surfaced with new material corresponding to that of the newly added sections of the buildings. Both buildings were entirely transformed and made to serve usefully for a greatly extended period.

It is never an alluring prospect for the designer to assume the handicaps of an obsolete and incongruous structure, but the reformed sinner is not more miraculous than the changed appearance and character of some of these structures which have undergone a thoroughgoing rejuvenation by patient and considerate hands.

Old High School, Cadillac, Mich., after alterations were begun in 1911.

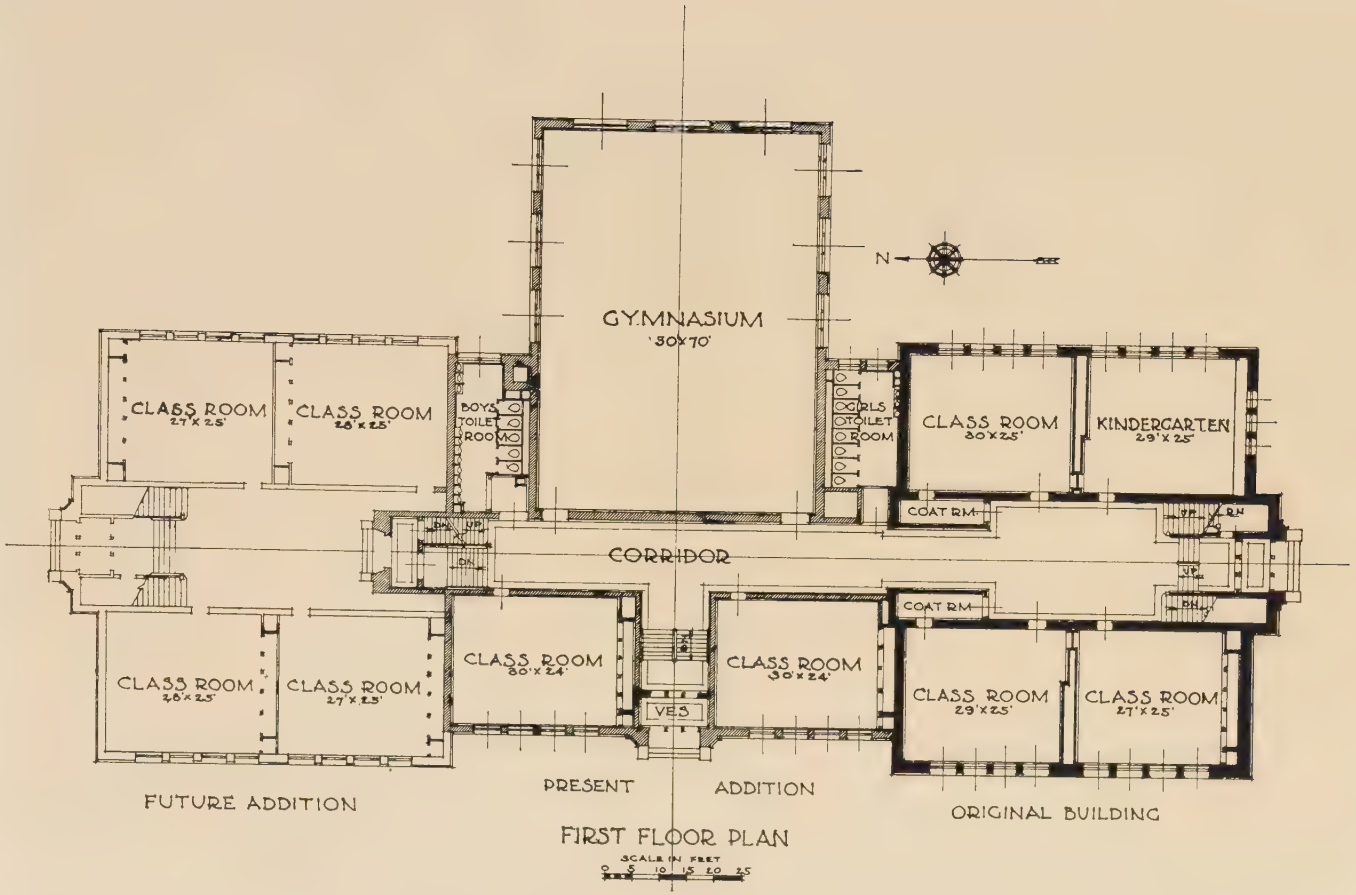
New High School, Cadillac, Mich., having reconstructed old building in center.



Plans showing original and new sections, Cadillac, Mich., High School.

Old Whitewater School, Richmond, Ind., now in process of reconstruction.

Whitewater School, Richmond, Ind., as it will appear when additions and alterations are finished.



Whitewater School, Richmond, Ind., plan showing old and new sections.

SECTION XI

High School Manual Training Shops

Illustrating

Shop Section, Bay City, Mich., High School

Shop Section, Mishawaka, Ind., High School

Shop Section, Fond du Lac, Wis., High School

Shop Section, New Tier Township High School, Kenilworth, Ill.

Designed by

PERKINS, FELLOWS AND HAMILTON

Architects, Chicago

High School Manual Training Shops

THE authors' theory of correct design for a group of manual training shops of a large modern high school is typified in the accompanying illustrations of the shop sections of the Bay City, Michigan, and Mishawaka, Indiana, high schools.

These shops are housed in a one-story structure connected with the main or academic building. The shops are arranged in an orderly relation to one another and to their coordinated work. Mechanical drawing rooms are placed nearby. Noise, dirt and fire hazard isolated from academic building. The industrial types of sky-lighting and monitor sash ventilation are adopted and unrestricted provision is made for future expansion. As electric driven machinery with individual motors is now the rule, there is no essential reason for placing the heating plant with the manual training wing, although it is often convenient to do so.

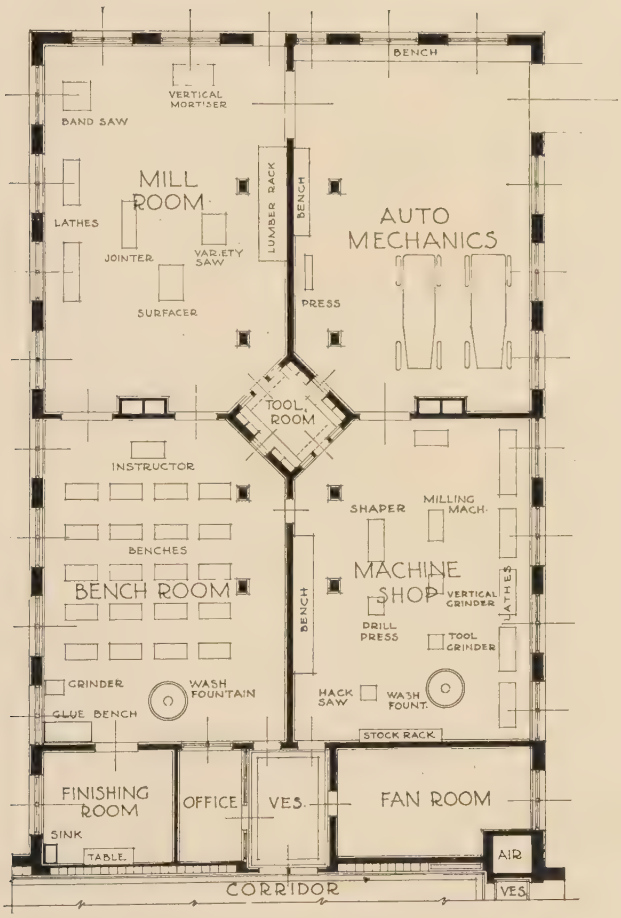
The interior walls of these shops are built of common brick or hollow tile, neatly laid and painted. Maple floors of extra thickness are preferred in wood working shops, while concrete or asphalt floors are used in metal shops.

Auto mechanics shops are more and more in demand and such instruction, no doubt, fills a

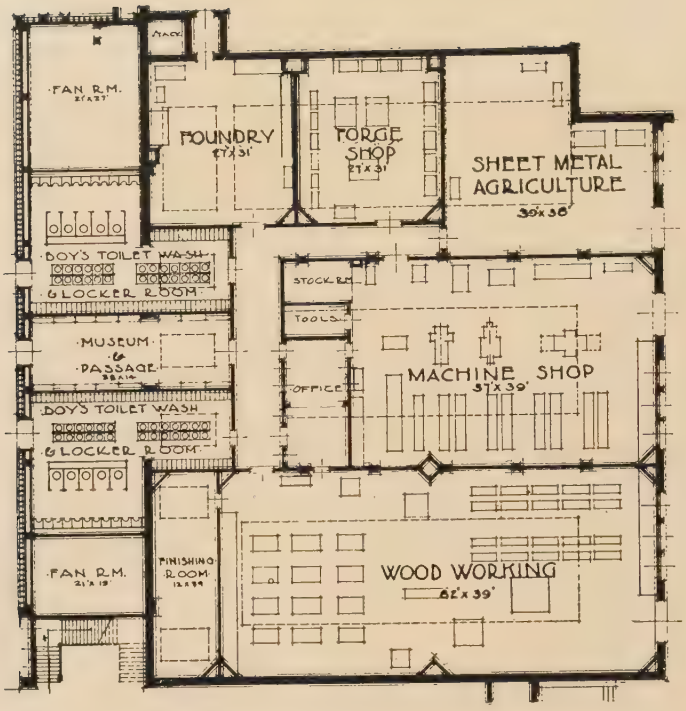
very useful purpose, considering the widespread use of motor driven vehicles.

Sheet metal shops are also being installed in many institutions and that art undoubtedly contains much of instructive value.

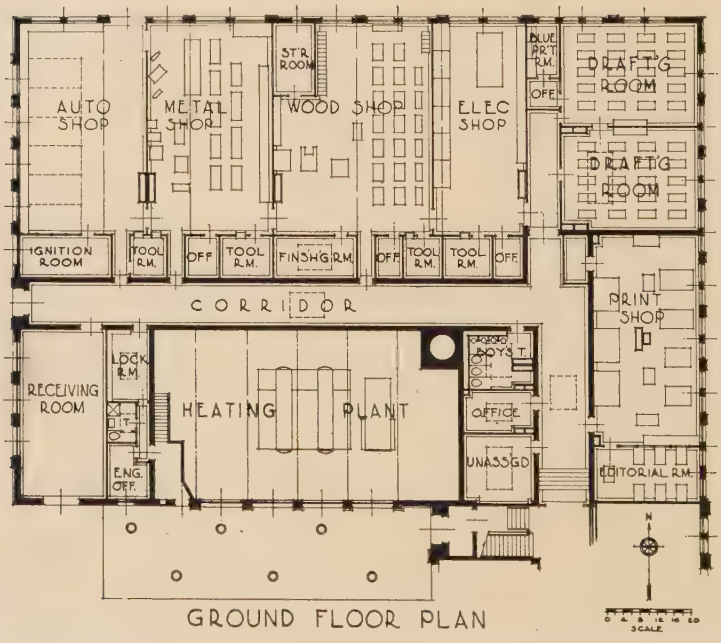
The Fond du Lac High School is a more modified suite due to the presence in that city of a vocational training school of the type generally established in Wisconsin.



Plan of Manual Training Shops, addition to Fond du Lac, Wis., High School, under construction in 1925.



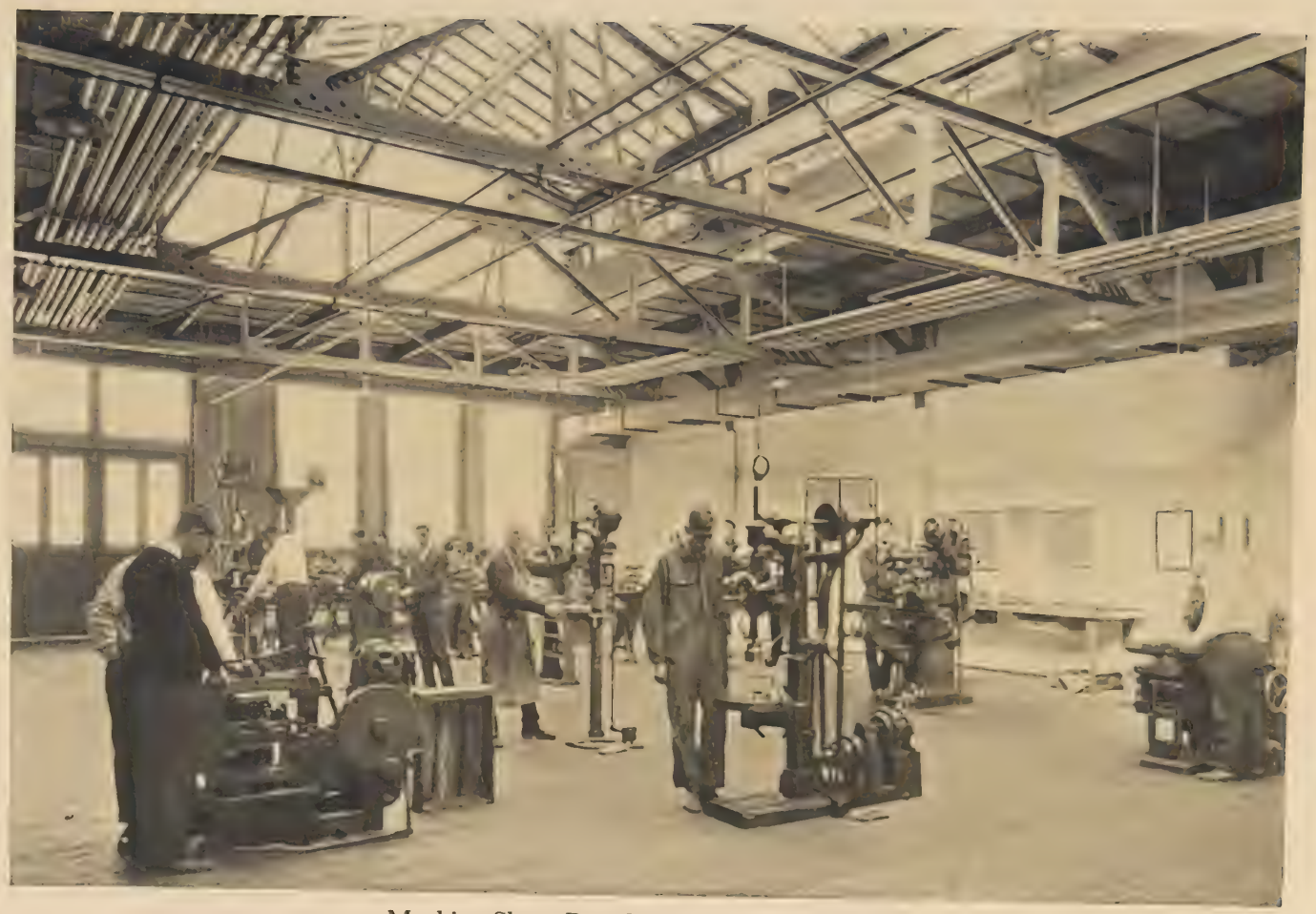
Plan of Manual Training Shops, Bay City, Mich., High School.



Plan of Manual Training Shops and Heating Plant, Mishawaka, Ind., High School.

Forge Shop, Bay City, Mich., High School.

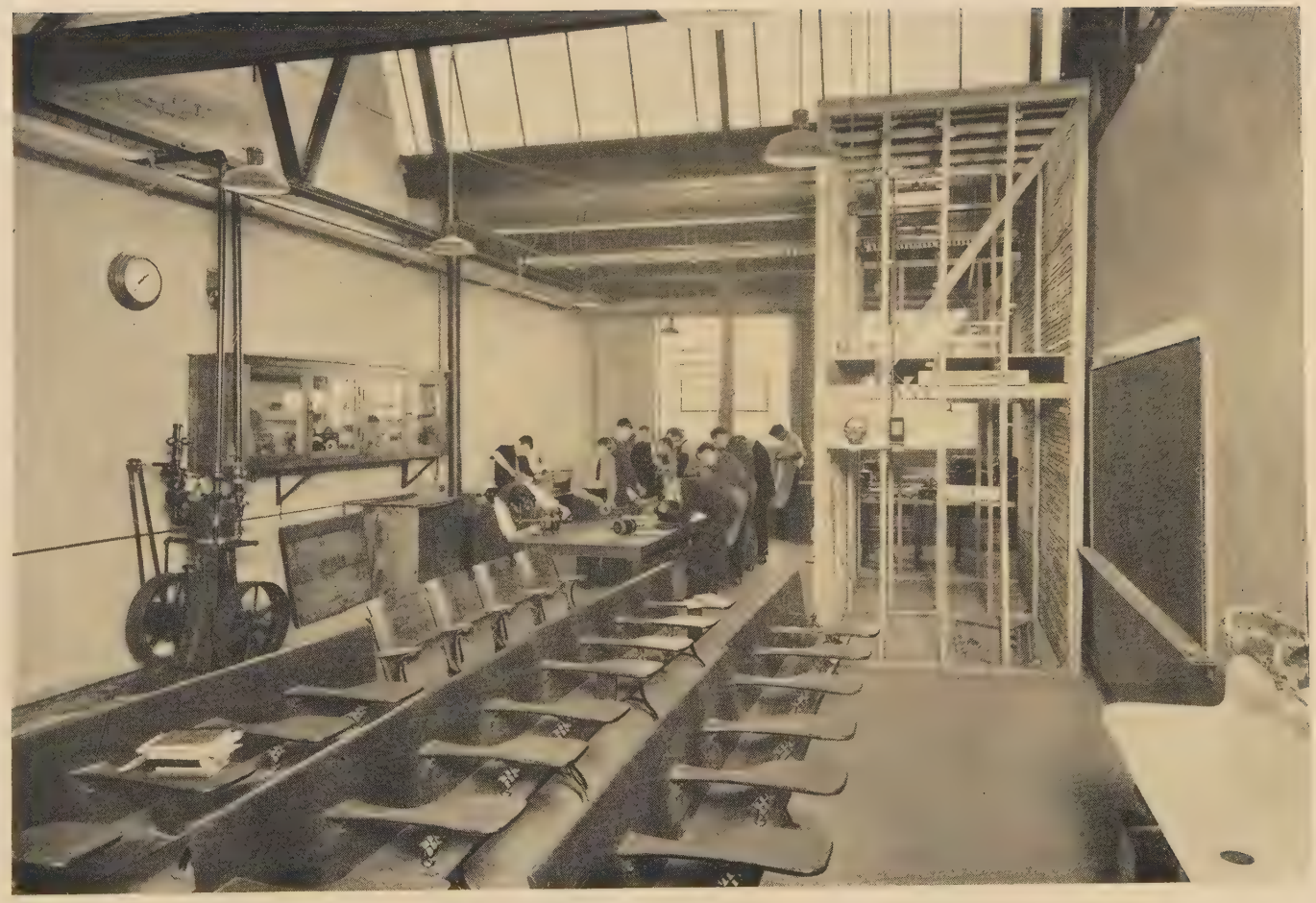
Wood-working Shop, Bay City, Mich., High School.



Machine Shop, Bay City, Mich., High School.

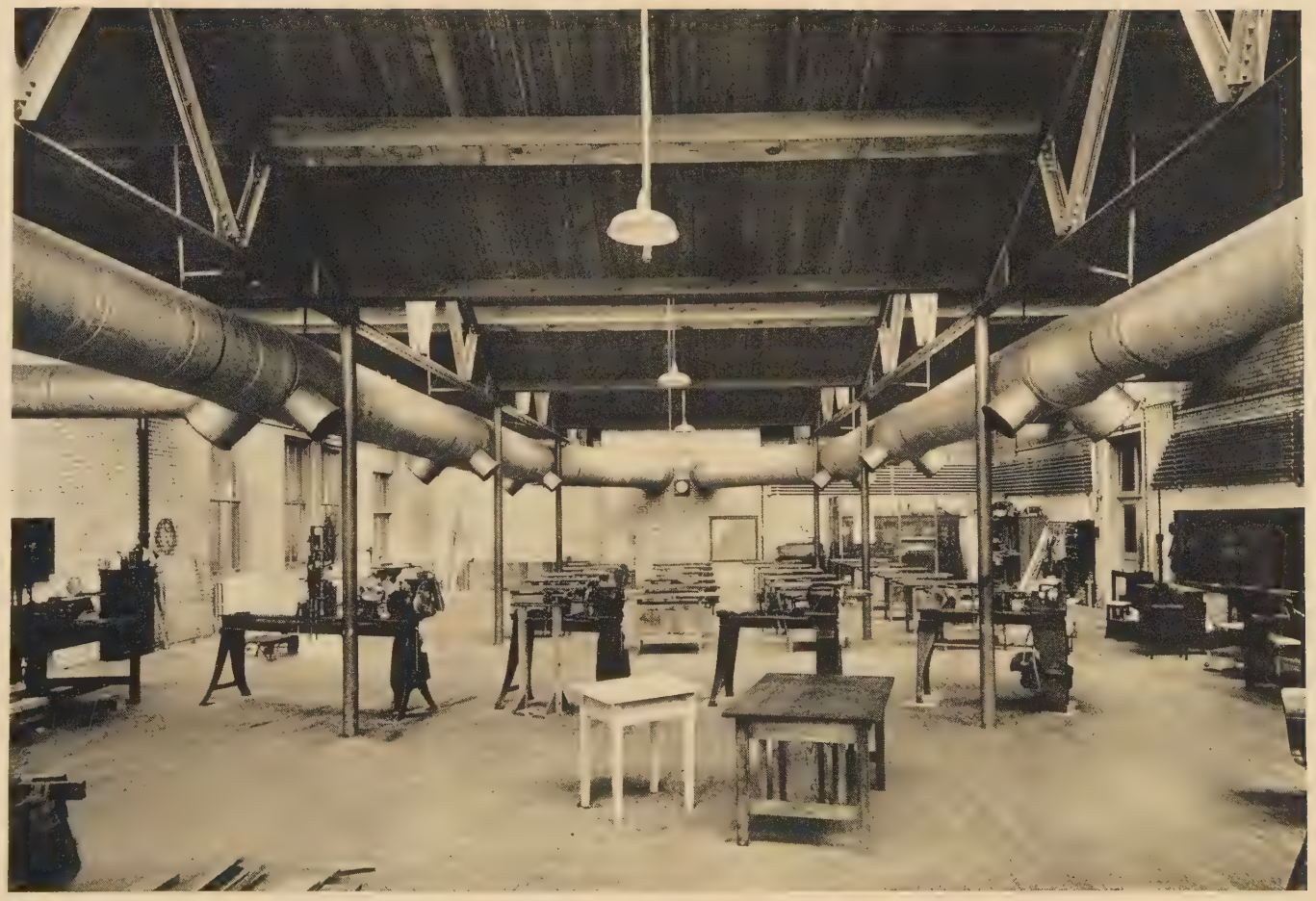
Automobile Shop, Bay City, Mich., High School.

Automobile Mechanics Shop, Mishawaka, Ind., High School.



Electrical Engineering Laboratory, Mishawaka, Ind., High School.

Wood-working Shop, Mishawaka, Ind., High School.



General Manual Training Shop, Niles, Mich., High School.

SECTION XII

Advice on the Selection of Architects

PERKINS, FELLOWS & HAMILTON

Architects, Chicago

The Selection of Architects

IT IS AS a fine art that architecture has established itself in the hearts of men. If it had been merely the science of building or even of building well, its appeal would not have brought to it minds such as those of Ictinus and Michael Angelo. To good building, architecture adds high qualities of the imagination. It disposes of masses and details in ways that arouse us by their beauty, power or dignity. It writes the record of civilization.

The Architect, though primarily an artist, must still be the master, either in himself or through others, of all the applied sciences necessary to sound and economic building sciences that have generated and that attempt to satisfy many of the exacting and complex demands of modern life.

The Architect, by expressing his ideas in forms and words of exact contractual significance, by controlling machinery for their embodiment, by giving just decisions between conflicting interests, by bearing himself as worthy of his high calling, gives to his art the status of a profession.

The Architect must play the role of creative artist, sound constructor, professional adviser, business administrator, and fearless judge. Unless endowed with such varied talents as are rarely to be found in one man, he associates with himself others differently gifted. While architecture as a fine art is an individual effort, architecture as a profession is generally a cooperative undertaking.

The Architect, having agreed to act as the owner's professional adviser, must, if their interests be

in conflict, put the owner's above his own. His duties place him in a professional rather than a commercial relation to contractors, to his assistants, to his fellow architects, and to the public.

The Architect owes his client a competent management of business affairs, whether large or small, for a small loss to the owner of a small building may be just as grievous as a large loss to the owner of a large building. Good management is vital, for, granting the work to have been skillfully designed, and wisely specified, its swift and proper execution depends in no small part on the Architect's ability as an administrator. The effectiveness with which he conducts the routine of extras and omissions, of applications for payment, of issuance of certificates, facilitates the complex processes of building, just as a lax administration clogs them. Expert management of innumerable details conduces not merely to getting the utmost for the owner's money, but leads to the avoidance of those misunderstandings between owner, architect and contractor that so often embitter relations, which, under skillful guidance, might be those of confidence and mutual respect.*

The choice of an architect for service on an important building, whether of a public or private nature, should be made with as much forethought and care as the selection of a surgeon to perform a delicate operation and should be based solely on proven ability to perform the required service, as demonstrated by successfully completed work of a similar character.

**From Preface to Handbook of Architectural Practice, American Institute of Architects.*

These discriminations lead in the profession of architecture as in other professions to a high degree of specialization which, when followed successfully to its logical conclusion, results in the formation of professional service groups trained by accumulated experience to render complete and expert service of a specially selected kind. When the advantages of such training and experience are fully realized by such a group, an ability to serve in special cases may be acquired which outweighs all considerations of distance, friendship and business associations, in the minds of prospective patrons needing such service. As evidence, the famous Mayo Clinic at Rochester, Minnesota.

In the selection of architects for public and semi-public buildings consideration of local pride and political expediency are too frequently allowed to prevail, sometimes to the end that the services of the trained specialist are retained only in a superficial and ineffective capacity as a consultant with only advisory authority.

In other instances a compromise is reached by which the specialist is associated with the local architect who may or may not be well qualified to do his part but whose deficiencies are assumed to have been offset by the specialist's qualifications.

It is a rare instance when these temporary professional alliances, superinduced by force of circumstances, result in the establishment of the esprit de

corps on the part of owner and architects, necessary to produce the highest results. A divided responsibility is almost inevitable with a divided authority. Architectural service should be completely rendered by one organization under one authority from the inception to the completion of the project.

The selection of architects by submission of design drawings in competition has in a few exceptional instances, involving buildings of great importance, met a measure of success. Such competitions in order to attract architects of reputation must be conducted in a formal manner with the aid of a professional adviser and a definite program and agreement with competing architects. Though it cannot be denied that some of these competitions have had a stimulating effect upon those engaged, the net result from a broad viewpoint is the dissipation of the energies of the architect and his associates and a decrease in the efficiency of their service to clients who have favored them by direct employment.

The informal submission of designs and preliminary sketches by architects is not countenanced as professional practice by the American Institute of Architects and is not done by architects of established reputation.

For the further advice of their friends and patrons the authors append the Standard Form of Contract between Architect and Owner adopted by the American Institute of Architects.

This Agreement, made the .....day of.....in the year Nineteen Hundred and.....by and between.....hereinafter called the Owner, and.....hereinafter called the Architect,

WITNESSETH, that whereas the Owner intends to erect.....

.....

NOW, THEREFORE, the Owner and the Architect, for the considerations hereinafter named, agree as follows:

The Architect agrees to perform, for the above-named work, professional services as stated in Article 1 of the "Conditions of Agreement between Owner and Architect," hereinafter set forth.

The Owner agrees to pay the Architect at the rate of.....per cent, hereinafter called the basic rate, computed and payable as stated in the said "Conditions," and to make any other payments and reimbursements arising out of the said "Conditions."

The parties hereto further agree to the following:

Article 1. THE ARCHITECT'S SERVICES. The Architect's professional services consist of the necessary conferences, the preparation of preliminary studies, working drawings, specifications, large scale and full size detail drawings; the drafting of forms of proposals and contracts; the issuance of certificates of payment; the keeping of accounts, the general administration of the business and supervision of the work.

2. THE ARCHITECT'S FEE. The fee payable by the Owner to the Architect for the performance of the above services is the percentage hereinbefore defined as the basic rate, computed upon the cost, of the work in respect of which such services have been performed subject, however, to any modifications growing out of these Conditions of Agreement.

3. REIMBURSEMENTS. The Owner is to reimburse the Architect the costs of transportation and living incurred by him and his assistants while traveling in discharge of duties connected with the work, and the costs of the services of heating, ventilating, mechanical and electrical engineers.

4. SEPARATE CONTRACTS. The basic rate as hereinbefore defined is to be used when all of the work is let under one contract. Should the Owner determine to have certain portions of the work executed under separate contracts, as the Architect's burden of service, expense, and responsibility is thereby increased, the rate in connection with such portions of the work shall be four per cent greater than the basic rate. Should the Owner determine to have substantially the entire work executed under separate contracts, then such higher rate shall apply to the entire work. In any event, however, the basic rate shall, without increase, apply to contracts for any portions of the work on which the Owner reimburses the Engineer's fees to the Architect, and to the cost of articles not designed by the Architect but purchased under his direction.

5. EXTRA SERVICES AND SPECIAL CASES. If after a definite scheme has been approved, the Owner makes a decision which, for its proper execution, involves extra services and expense for changes in or additions to the drawings, specifications or other documents; or if a contract be let by cost of labor and material plus a percentage or fixed sum; or if the Architect is put to labor or expense by delays caused by the Owner or a contractor, or by the delinquency or insolvency of either, or as a result of damage by fire he shall be equitably paid for such extra service and expense.

Should the execution of any work designed or specified by the Architect, or any part of such work be abandoned or suspended, the Architect is to be paid in accordance with or in proportion to the terms of Article 6 for the service rendered on account of it, up to the time of such abandonment or suspension.

6. PAYMENTS. Whether the work be executed or whether its execution be suspended or abandoned in part or whole, payments to the Architect on his fee are, subject to the provisions of Article 5, to be made as follows:

Upon completion of the preliminary studies, a sum equal to 20% of the basic rate computed upon a reasonable estimated cost.

Upon completion of specifications and general working drawings (exclusive of details) a sum sufficient to increase payments on the fee to 60% of the rate or rates of commission arising from this agreement, computed upon a reasonable cost estimated on such completed specifications and drawings, or if bids have been received, then computed upon the lowest bona fide bid or bids.

From time to time during the execution of work and in proportion to the amount of service rendered by the Architect, payments shall be made until the aggregate of all payments made on account of the fee under this Article, but not including any covered by the provisions of Article 5, shall be a sum equal to the rate or rates of commission arising from this Agreement, computed upon the final cost of the work.

Payments to the Architect, other than those on his fee, fall due from time to time as his work is done or as costs are incurred.

No deduction shall be made from the Architect's fee on account of penalty, liquidated damages, or other sums withheld from payments to contractor.

7. THE OWNER'S DECISIONS. The Owner shall give thorough consideration to all sketches, drawings, specifications, proposals, contracts and other documents laid before him by the Architect and, whenever prompt action is necessary, he shall inform the Architect of his decisions in such reasonable time as not to delay the work of the Architect nor to prevent him from giving drawings or instructions to contractors in due season.

8. SURVEY, BORINGS AND TESTS. The Owner shall furnish the Architect with a complete and accurate survey of the building site, giving the grades and lines of streets, pavements, and adjoining properties; the rights, restrictions, easements, boundaries, and contours of the building site, and full information as to sewer, water, gas, and electrical service. The Owner is to pay for borings or test pits and for chemical, mechanical, or other tests when required.

9. SUPERVISION OF THE WORK. The Architect will endeavor to guard the Owner against defects and deficiencies in the work of contractors, but he does not guarantee the performance of their contracts. The supervision of an architect is to be distinguished from the continuous personal superintendence to be obtained by the employment of a clerk-of-the-works.

When authorized by the Owner, a clerk-of-the-works acceptable to both Owner and Architect shall be engaged by the Architect at a salary satisfactory to the Owner and paid by the Owner, upon presentation of the Architect's monthly certificates.

10. PRELIMINARY ESTIMATES. When requested to do so, the Architect will make or procure preliminary estimates on the cost of the work and he will endeavor to keep the actual cost of the work as low as may be consistent with the purpose of the building and with proper workmanship and material, but no such estimate can be regarded as other than an approximation.

11. DEFINITION OF THE COST OF THE WORK. The words "the cost of the work," as used in Articles 2 and 6 hereof, are ordinarily to be interpreted as meaning the total of the contract sums incurred for the execution of the work, not including Architect's and Engineer's fees, or the salary of the clerk-of-the-works, but in certain rare cases, e. g., when labor or material is furnished by the Owner below its market cost or when old materials are re-used, the cost of the work is to be interpreted as the cost of all materials and labor necessary to complete the work, as such cost would have been if all materials had been new and if all labor had been fully paid at market prices current when the work was ordered, plus contractor's profits and expenses.

12. OWNERSHIP OF DOCUMENTS. Drawings and specifications as instruments of service are the property of the Architect whether the work for which they are made be executed or not.

13. SUCCESSORS AND ASSIGNMENT. The Owner and the Architect each binds himself, his successors, executors, administrators and assigns to the other party to this agreement, and to the successors, executors, administrators and assigns of such other party in respect of all the covenants of this agreement.

The Architect shall have the right to join with him in the performance of this agreement, any architect or architects with whom he may in good faith enter into partnership relations. In case of the death or disability of one or more partners, the rights and duties of the Architect, if a firm, shall devolve upon the remaining partner or partners or upon such firm as may be established by him or them, and he, they

or it shall be recognized as the "successor" of the Architect, and so on until the service covered by the agreement has been performed. The Owner shall have the same rights, but in his case no limitation as to the vocation of those admitted to partnership is imposed.

Except as above, neither the Owner nor the Architect shall assign, sublet or transfer his interest in this agreement without the written consent of the other.

14. ARBITRATION. All questions in dispute under this agreement shall be submitted to arbitration at the choice of either party.

No one shall be nominated or act as an arbitrator who is in any way financially interested in this contract or in the business affairs of either party.

The general procedure shall conform to the laws of the State in which the work is to be erected. Unless otherwise provided by such laws, the parties may agree upon one arbitrator; otherwise there shall be three, one named in writing by each party and the third chosen by these two arbitrators, if they fail to select a third within ten days, then he shall be chosen by the presiding officer of the Bar Association nearest to the location of the work. Should the party demanding arbitration fail to name an arbitrator within ten days of his demand, his right to arbitration shall lapse. Should the other party fail to choose an arbitrator within said ten days, then such presiding officer shall appoint such arbitrator. Should either party refuse or neglect to supply the arbitrators with any papers or information demanded in writing, the arbitrators are empowered by both parties to proceed ex parte.

The arbitrators shall act with promptness. If there be one arbitrator his decision shall be binding; if three, the decision of any two shall be binding. Such decision shall be a condition precedent to any right of legal action, and wherever permitted by law it may be filed in Court to carry it into effect.

The arbitrators shall fix their own compensation, unless otherwise provided by agreement, and shall assess the costs and charges of the arbitration upon either or both parties.

The award of the arbitrators must be in writing and, if in writing, it shall not be open to objection on account of the form of the proceedings or the award, unless otherwise provided by the laws of the State in which the work is to be erected.

The Owner and the Architect hereby agree to the full performance of the covenants contained herein,

IN WITNESS WHEREOF they have executed this agreement, the day and year first above written.

..... Witness Signed .....Owner

..... Witness Signed .....Architect

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P5 Hamilton

Educational buildings

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